

# FCC RADIO TEST REPORT

according to

47 CFR FCC Part 15 Subpart C § 15.247

**Equipment** : **Wireless Access Point**  
**Model No.** : **BSAP-1800**  
**Brand Name** : **bluesocket**  
**Filing Type** : **Addational**  
**Applicant** : **Bluesocket, Incorporated**  
10 North Ave Burlington Massachusetts 01803  
United States  
**FCC ID** : **TIH-BSAP1800V2**  
**Manufacturer** : **DONG GUAN G-COM COMPUTER CO., LTD**  
1<sup>st</sup> Row Yin Shan Rd., Yin Hwu Industrial  
Area, Qingxi Town, DongGuan City, Guang  
Dong, China  
**Received Date** : Jul. 09, 2009  
**Final Test Date** : Mar. 02, 2010

## Statement

**Test result included is only for the 802.11n 2.4G and 5G (5725 ~ 5850MHz) and PIFA Antenna of the product.**

The test result in this report refers exclusively to the presented test model / sample.

Without written approval of SPORTON International Inc., the test report shall not be reproduced except in full.

The measurements and test results shown in this test report were made in accordance with the procedures and found in compliance with the limit given in **ANSI C63.4-2003** and **47 CFR FCC Part 15 Subpart C**.

The test equipment used to perform the test is calibrated and traceable to NML/ROC.



**SPORTON International Inc.**

6F, No. 106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

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# **CERTIFICATE OF COMPLIANCE**

according to

47 CFR FCC Part 15 Subpart C § 15.247

Equipment : Wireless Access Point  
Model No. : BSAP-1800  
Brand Name : bluesocket  
Applicant : Bluesocket, Incorporated  
10 North Ave Burlington Massachusetts 01803  
United States

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Jul. 09, 2009 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.

Wayne Hsu

***SPORTON International Inc.***

*6F, No.106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.*

**1 SUMMARY OF THE TEST RESULT**

<b>Applied Standard: 47 CFR FCC Part 15 Subpart C</b>				
<b>Part</b>	<b>Rule Section</b>	<b>Description of Test</b>	<b>Result</b>	<b>Under Limit</b>
3.1	15.207	AC Power Line Conducted Emissions	Complies	1.62 dB
3.2	15.247(b)(3)	Maximum Conducted Output Power	Complies	5.06 dB
3.3	15.247(e)	Power Spectral Density	Complies	12.43 dB
3.4	15.247(a)(2)	6dB Spectrum Bandwidth	Complies	-
3.5	15.247(d)	Radiated Emissions	Complies	1.59 dB
3.6	15.247(d)	Band Edge Emissions	Complies	1.00 dB
3.7	15.203	Antenna Requirements	Complies	-

<b>Test Items</b>	<b>Uncertainty</b>	<b>Remark</b>
AC Power Line Conducted Emissions	±2.3dB	Confidence levels of 95%
Maximum Peak Conducted Output Power	±0.8dB	Confidence levels of 95%
Power Spectral Density	±0.5dB	Confidence levels of 95%
6dB Spectrum Bandwidth	±8.5×10 <sup>-8</sup>	Confidence levels of 95%
Radiated Emissions (9kHz~30MHz)	±0.8dB	Confidence levels of 95%
Radiated Emissions (30MHz~1000MHz)	±1.9dB	Confidence levels of 95%
Radiated / Band Edge Emissions (1GHz~18GHz)	±1.9dB	Confidence levels of 95%
Radiated Emissions (18GHz~40GHz)	±1.9dB	Confidence levels of 95%
Temperature	±0.7	Confidence levels of 95%
Humidity	±3.2%	Confidence levels of 95%
DC / AC Power Source	±1.4%	Confidence levels of 95%

**2 GENERAL INFORMATION**

**2.1 Product Details**

Only the radio detail of IEEE 802.11n of PIFA Antenna is shown in the table below. For more detailed features description, please refer to the manufacturer’s specifications or user’s manual.

Items	Description
Modulation	See the below table for IEEE 802.11n
Data Modulation	OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	See the below table for IEEE 802.11n
Frequency Range	2400 ~ 2483.5MHz / 5725 ~ 5850MHz
Channel Number	2.4G- 11 for 20MHz bandwidth ; 7 for 40MHz bandwidth 5G- 5 for 20MHz bandwidth ; 2 for 40MHz bandwidth
Channel Band Width (99%)	2.4G- 2TX- MCS 8 (20MHz) : 17.60 MHz ; MCS 8 (40MHz) : 36.28 MHz 5G- 2TX- MCS 8 (20MHz) : 17.60 MHz ; MCS 8 (40MHz) : 36.28 MHz
Conducted Output Power	2.4G- 2TX- MCS 8 (20MHz) : 24.75 dBm ; MCS 8 (40MHz) : 24.94 dBm 5G- 2TX- MCS 8 (20MHz) : 15.76 dBm ; MCS 8 (40MHz) : 15.87 dBm

**2.2 Table for Filed Antenna**

**Antenna & Bandwidth- PIFA Antenna (TFF-Z016MPXX-361)**

Antenna Mode	Single Chain		Two Chain	
	20 MHz	40 MHz	20 MHz	40 MHz
Bandwidth Mode				
802.11b	X	X	V	X
802.11g	X	X	V	X
802.11n(2.4GHz)	X	X	V	V
802.11a (5150~5250MHz)	X	X	V	X
802.11a (5725~5850MHz)	X	X	V	X
802.11n (5150~5250MHz)	X	X	V	V
802.11n (5725~5850MHz)	X	X	V	V

Ant.	Antenna Type	Model Name	Product description	Gain (dBi)	Tx/Rx mode	REMARK
4	PIFA Antenna	TFF-Z016MPXX-361	Integrated PIFA Antenna	4.98/5.08	2T3R concurrent	Main Ant. for test

**PIFA Antenna (TFF-Z016MPXX-361)**

Ant . Port	Antenna Type	Connector	Gain (dBi)		Remark
			2.4G	5G	
A	PIFA Antenna	U.FL	4.98	5.08	TX / RX
B	PIFA Antenna	U.FL	4.98	5.08	TX / RX
C	PIFA Antenna	U.FL	4.98	5.08	RX
D	PIFA Antenna	U.FL	4.98	5.08	TX / RX
E	PIFA Antenna	U.FL	4.98	5.08	TX / RX
F	PIFA Antenna	U.FL	4.98	5.08	RX

**Antenna note:** This antenna system has six antenna elements in this EUT. (3 antenna elements for 2.4GHz band and 3 antenna elements for 5GHz band) Three antenna elements used in the same band have 2T3R concurrent spatial multiplexing MIMO configuration and two of them for signal transmitting/receiving and the other antenna for signal receiving only whenever in 2.4GHz or 5GHz.

**IEEE 802.11n Modulation Scheme**

MCS Index	Nss	Modulation	R	NBPS	NCBPS		NDBPS		Data rate(Mbps)	
					20MHz	40MHz	20MHz	40MHz	800nsGI	
									20MHz	40MHz
0	1	BPSK	1/2	1	52	108	26	54	6.5	13.5
1	1	QPSK	1/2	2	104	216	52	108	13.0	27.0
2	1	QPSK	3/4	2	104	216	78	162	19.5	40.5
3	1	16-QAM	1/2	4	208	432	104	216	26.0	54.0
4	1	16-QAM	3/4	4	208	432	156	324	39.0	81.0
5	1	64-QAM	2/3	6	312	648	208	432	52.0	108.0
6	1	64-QAM	3/4	6	312	648	234	486	58.5	121.5
7	1	64-QAM	5/6	6	312	648	260	540	65.0	135.0
8	2	BPSK	1/2	1	104	216	52	108	13.0	27.0
9	2	QPSK	1/2	2	208	432	104	216	26.0	54.0
10	2	QPSK	3/4	2	208	432	156	324	39.0	81.0
11	2	16-QAM	1/2	4	416	864	208	432	52.0	108.0
12	2	16-QAM	3/4	4	416	864	312	648	78.0	162.0
13	2	64-QAM	2/3	6	624	1296	416	864	104.0	216.0
14	2	64-QAM	3/4	6	624	1296	468	972	117.0	243.0
15	2	64-QAM	5/6	6	624	1296	520	1080	130.0	270.0

Symbol	Explanation
NSS	Number of spatial streams
R	Code rate
NBPS	Number of coded bits per single carrier
NCBPS	Number of coded bits per symbol
NDBPS	Number of data bits per symbol
GI	guard interval

**2.3 Table for Carrier Frequencies**

**Frequency Allocation**

For 802.11n:

There are two bandwidth systems for IEEE 802.11n.

For 20MHz bandwidth systems, use Channel 149, 153, 157, 161, and 165.

For 40MHz bandwidth systems, use Channel 151, 159.

Frequency Band	Channel No.	Frequency
5725~5850 MHz	149	5745 MHz
	151	5755 MHz
	153	5765 MHz
	157	5785 MHz
	159	5795 MHz
	161	5805 MHz
	165	5825 MHz

**Frequency Allocation**

For 802.11n:

There are two bandwidth systems for IEEE 802.11n.

For 20MHz bandwidth systems, use Channel 1~Channel 11.

For 40MHz bandwidth systems, use Channel 3~Channel 9.

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
2400~2483.5MHz	1	2412 MHz	7	2442 MHz
	2	2417 MHz	8	2447 MHz
	3	2422 MHz	9	2452 MHz
	4	2427 MHz	10	2457 MHz
	5	2432 MHz	11	2462 MHz
	6	2437 MHz	-	-



**2.4 Table for Test Modes**

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible Configuration for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode	Data Rate	Channel	Antenna
AC Power Line Conducted Emissions	See the note	Auto	-	-
Maximum Peak Conducted Output Power Power Spectral Density 6dB Spectrum Bandwidth Radiated Emissions 1GHz~10 <sup>th</sup> Harmonic Band Edge Emissions	MCS 8 (20MHz)	13 Mbps	149/157/165	A/B A+B
	MCS 8 (40MHz)	27 Mbps	151/159	A/B A+B
	MCS 8 (20MHz)	13 Mbps	1/6/11	A/B A+B
	MCS 8 (40MHz)	27 Mbps	3/6/9	A/B A+B
Radiated Emissions 9kHz~1GHz	See the note	Auto	-	-

**Note: The following modes were tested:**

**Conducted Emissions**

Adapter Mode (DSA-15P-12 US)

Adapter Mode (DSA-20D-12 2)

POE Mode (Power Supply: POE20U-560(G) -R)

**In the Radiated (Below 1GHz) because POE Mode is performed the worst test result; it was reported as final data (30MHz~1GHz Chapter 3.5.8).**

**2.5 Table for Testing Locations**

Test Site No.	Site Category	Location	FCC Reg. No.	IC File No.
CO04-HY	Conduction	Hwa Ya	643075	IC 4086B-1
TH01-HY	OVEN Room	Hwa Ya	-	-
OS04-LK	OATS	Lin Kou	93596	IC 4086C-1
03CH02-HY	SAC	Hwa Ya	643075	IC 4086B-1

Open Area Test Site (OATS); Semi Anechoic Chamber (SAC); Fully Anechoic Chamber (FAC).

**2.6 Table for Supporting Units**

Support Unit	Brand	Model	FCC ID
P.C. (Remote Workstation)	COMPAQ	Evo D380mx	DoC
Notebook (Remote Workstation)	DELL	D400	DoC
Monitor (Remote Workstation)	COMPAQ	S510	DoC
Keyboard (PS2) (Remote Workstation)	COMPAQ	6511-VA	DoC
Mouse (PS2) (Remote Workstation)	COMPAQ	M-S69	JNZ211443
Switching Power Supply	PHIHONG	POE20U-560(G) -R	-

**2.7 Table for Parameters of Test Software Setting**

During testing, Channel & Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

**For Two Chain:**

**Power Parameters of IEEE 802.11n-5G Ant. A + Ant. B**

Test Software Version	ART 0.5 BUILD#25		
Frequency	5745 MHz	5785 MHz	5825 MHz
IEEE 802.11n(20MHz)	14.5	14.5	13
Frequency	5755 MHz	5795 MHz	-
IEEE 802.11n(40MHz)	14.5	14.5	-

**Power Parameters of IEEE 802.11n-2.4G Ant. A + Ant. B**

Test Software Version	ART 0.5 BUILD#25		
Frequency	2412 MHz	2437 MHz	2462 MHz
IEEE 802.11n(20MHz)	13.5	21	11
Frequency	2422 MHz	2437 MHz	2452 MHz
IEEE 802.11n(40MHz)	7.5	21	8

**2.8 EUT Operation during Test**

An executive program, EMCTEST.EXE under WIN XP, which generates a complete line of continuously repeating “ H “ pattern was used as the test software.

The NB sends “ H “ messages to the panel, and the panel displays “ H “ patterns on the screen.

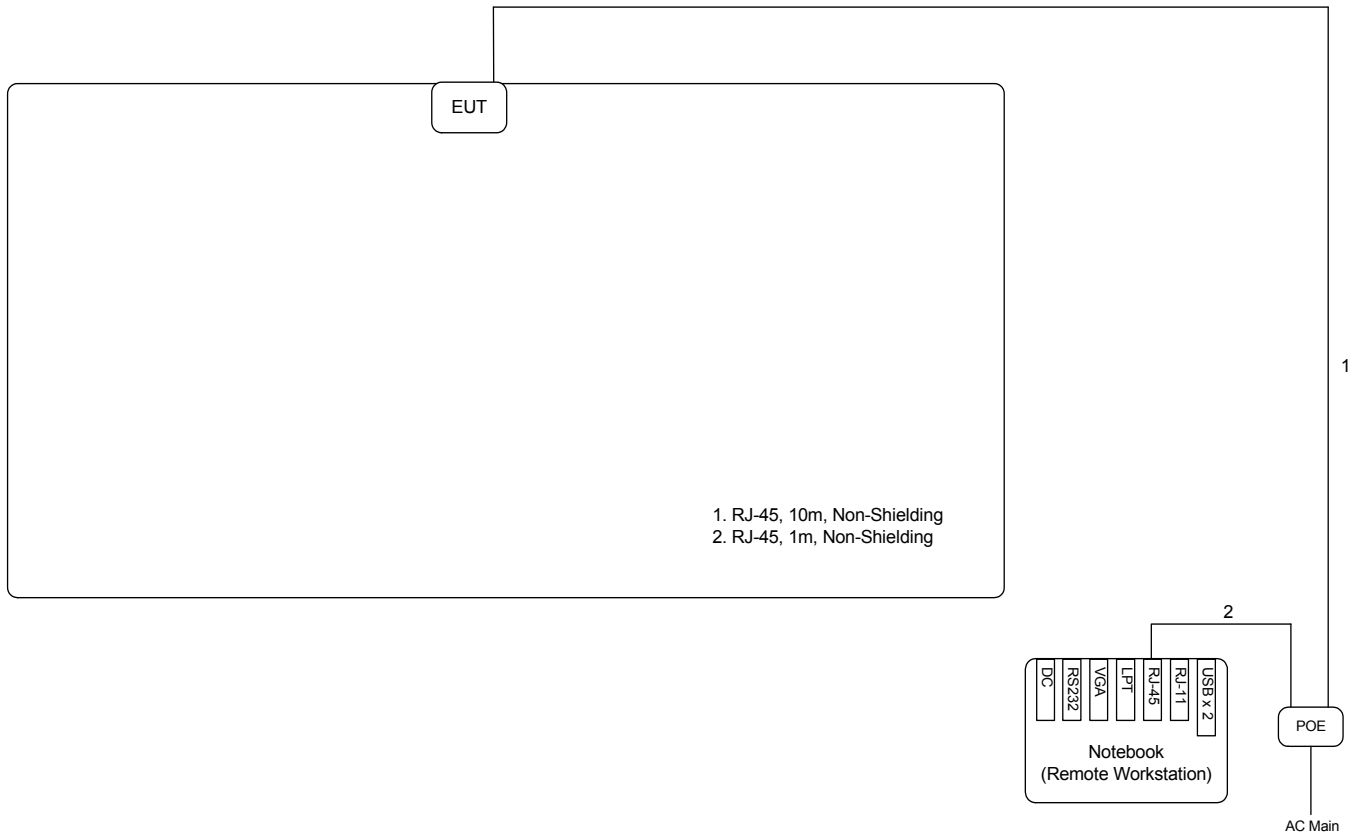
Executed "ping.exe" to link with the remote workstation to receive and transmit data by LAN and WLAN.

Executed “ART 0.5 BUILD#25” to keep transmitting signals at fixed frequency.

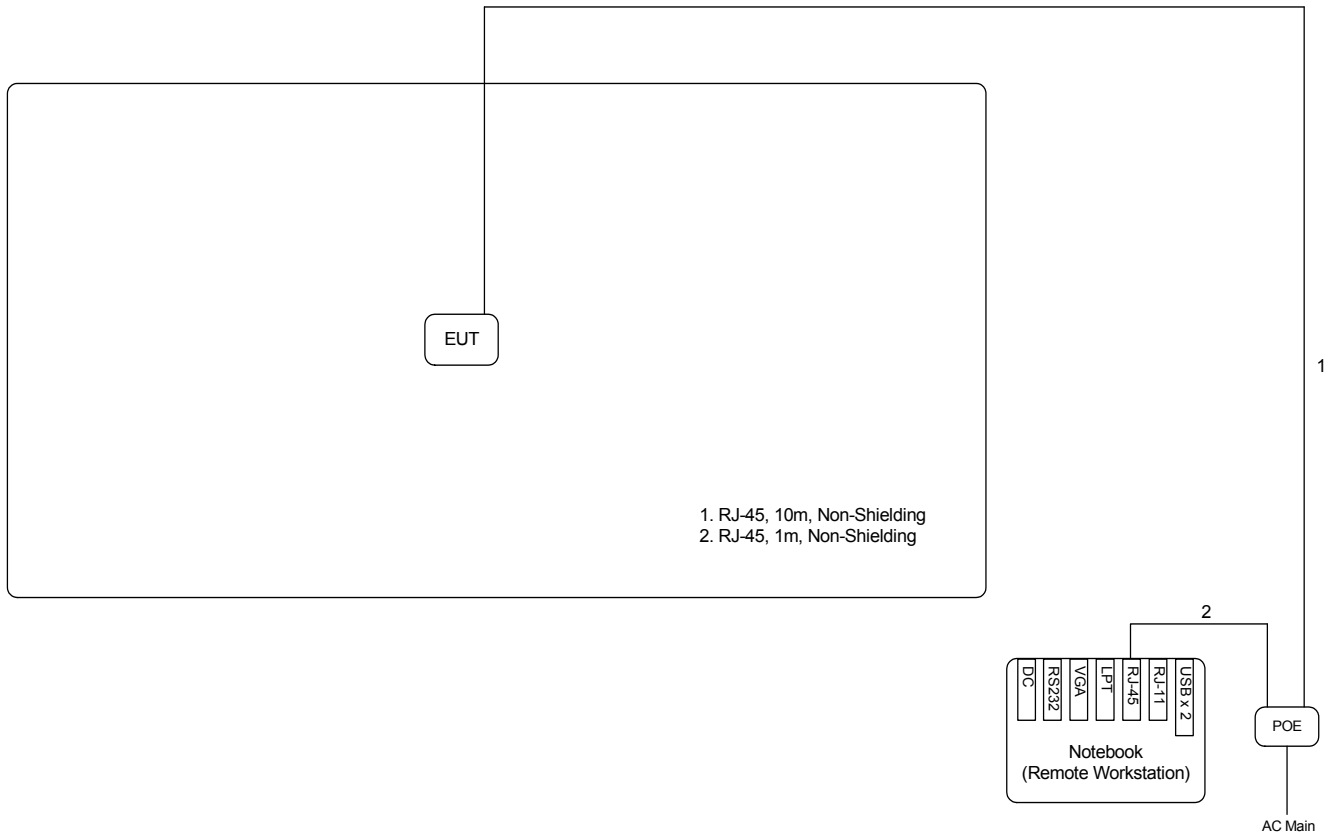
**2.9 Test Configuration**

**2.9.1 Radiation Emissions Test Configuration**

**For radiated emissions 9kHz~1GHz**



**For radiated emissions above 1GHz**



### 3 TEST RESULT

#### 3.1 AC Power Line Conducted Emissions Measurement

##### 3.1.1 Limit

For this product which is designed to be connected to the AC power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed below limits table.

**Class B**

Frequency (MHz)	QP Limit (dBuV)	AV Limit (dBuV)
0.15~0.5	66~56	56~46
0.5~5	56	46
5~30	60	50

##### 3.1.2 Measuring Instruments and Setting

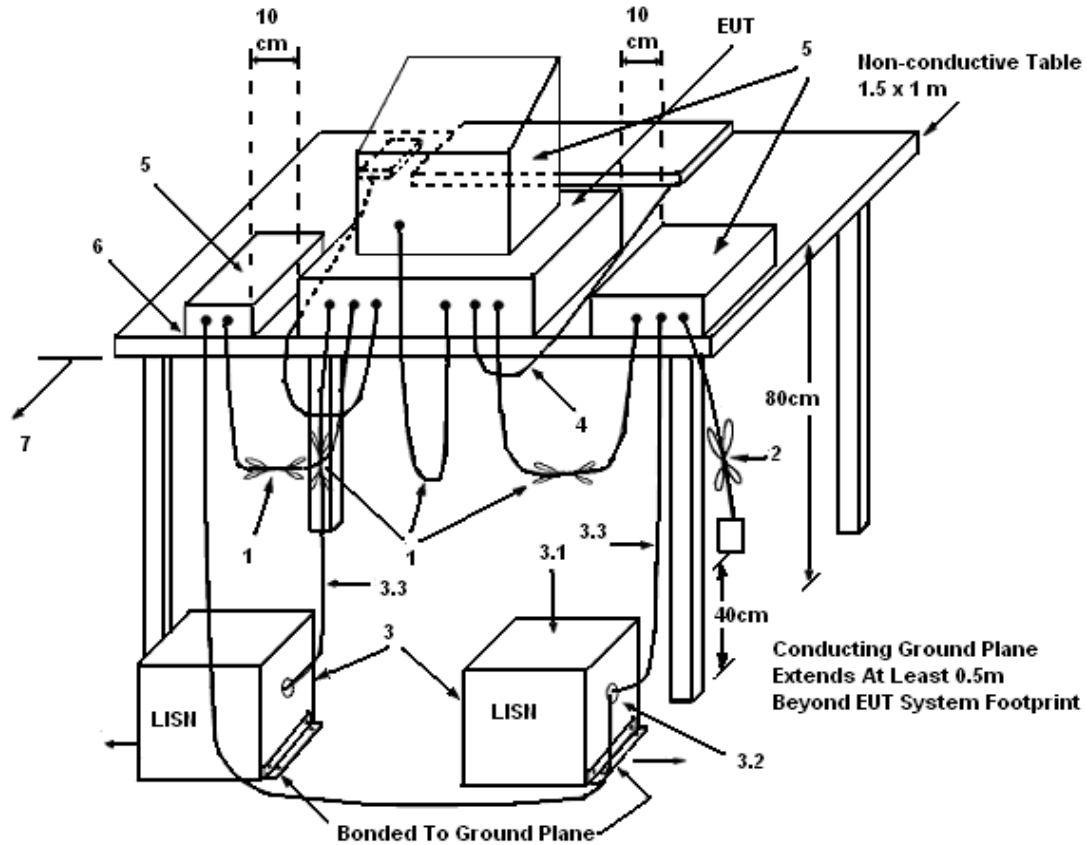
Please refer to section 4 of equipments list in this report. The following table is the setting of the receiver.

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 KHz

##### 3.1.3 Test Procedures

1. The EUT warm up about 15 minutes then start test.
2. Configure the EUT according to ANSI C63.4. The EUT or host of EUT has to be placed 0.4 meter far from the conducting wall of the shielding room and at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT or host of EUT to the power mains through a line impedance stabilization network (LISN).
4. All the support units are connected to the other LISNs. The LISN should provide 50uH/50ohms coupling impedance.
5. The frequency range from 150 KHz to 30 MHz was searched.
6. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
7. The measurement has to be done between each power line and ground at the power terminal.

3.1.4 Test Setup Layout



LEGEND:

- (1) Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- (2) I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- (3) EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50 Ω. LISN can be placed on top of, or immediately beneath, reference ground plane.
- (3.1) All other equipment powered from additional LISN(s).
- (3.2) Multiple outlet strip can be used for multiple power cords of non-EUT equipment.
- (3.3) LISN at least 80 cm from nearest part of EUT chassis.
- (4) Cables of hand-operated devices, such as keyboards, mice, etc., shall be placed as for normal use.
- (5) Non-EUT components of EUT system being tested.
- (6) Rear of EUT, including peripherals, shall all be aligned and flush with rear of tabletop.
- (7) Rear of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane.

3.1.5 Test Deviation

There is no deviation with the original standard.

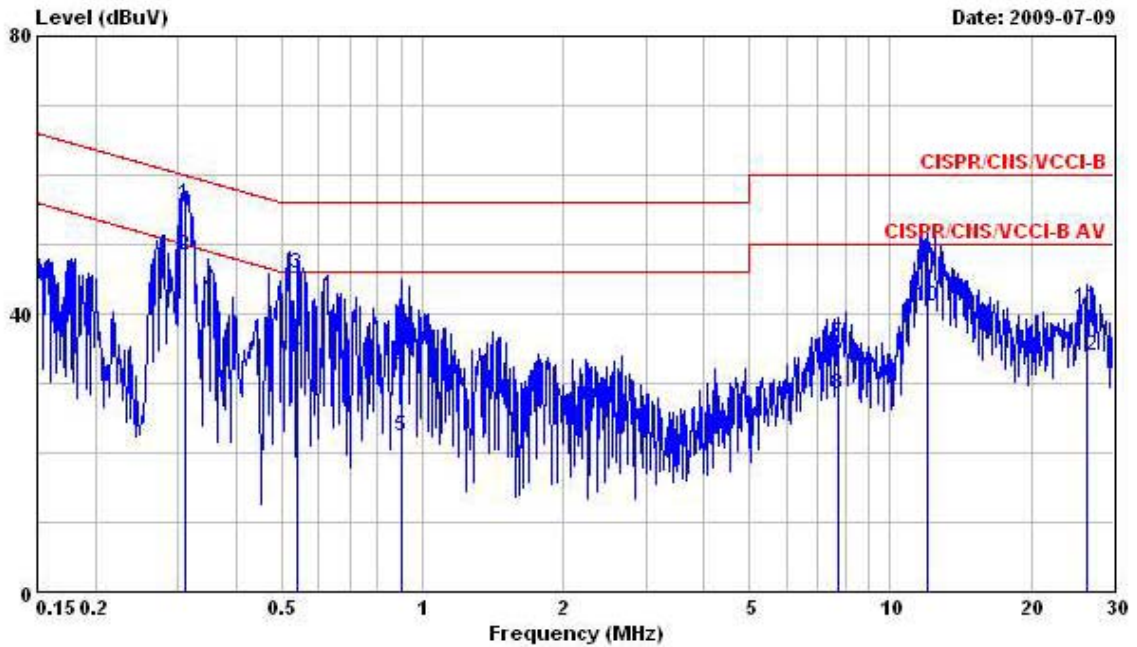
3.1.6 EUT Operation during Test

The EUT was placed on the test table and programmed in normal function.

3.1.7 Results of AC Power Line Conducted Emissions Measurement

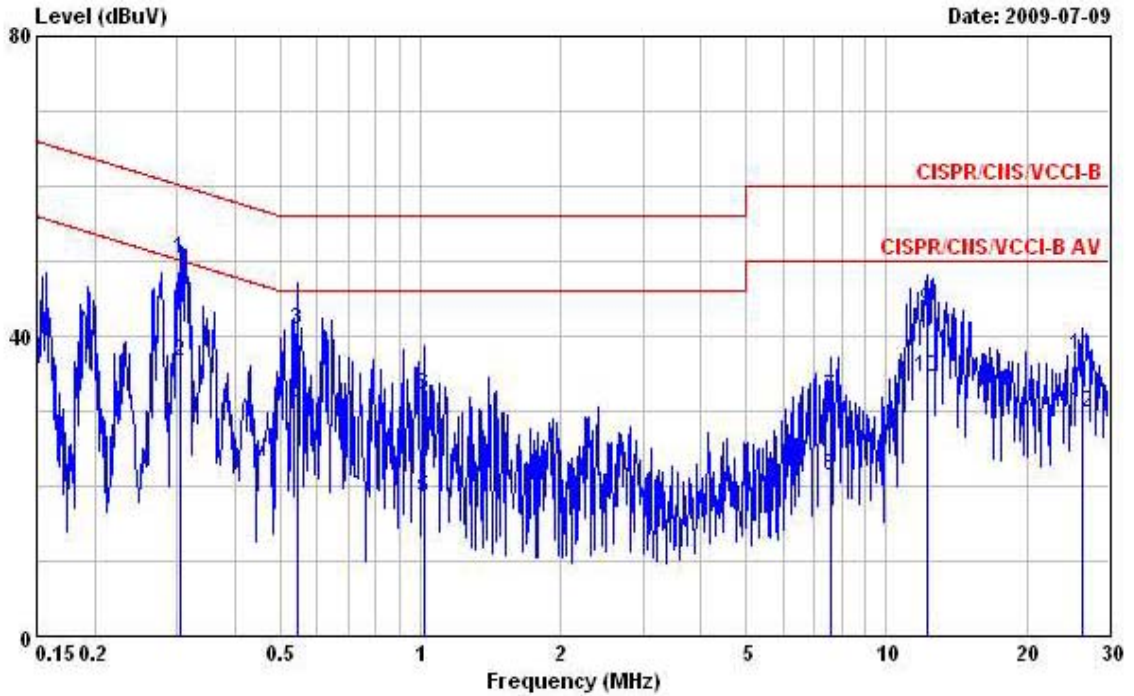
<b>Final Test Date</b>	Jul. 09, 2009	<b>Test Site No.</b>	CO04-HY
<b>Temperature</b>	25	<b>Humidity</b>	55%
<b>Test Engineer</b>	Chris	<b>Configuration</b>	Adapter Mode (DSA-15P-12 US)

Line



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	@0.3099790	55.87	-4.10	59.97	55.71	0.09	0.07	QP
2	@0.3099790	48.35	-1.62	49.97	48.19	0.09	0.07	Average
3	@0.5394920	45.72	-10.28	56.00	45.52	0.10	0.10	QP
4	0.5394920	34.19	-11.81	46.00	33.99	0.10	0.10	Average
5	0.8991650	22.31	-23.69	46.00	22.07	0.11	0.13	Average
6	0.8991650	32.74	-23.26	56.00	32.50	0.11	0.13	QP
7	7.730	35.80	-24.20	60.00	35.22	0.24	0.34	QP
8	7.730	28.34	-21.66	50.00	27.76	0.24	0.34	Average
9	12.000	47.54	-12.46	60.00	46.84	0.29	0.41	QP
10	@ 12.000	40.92	-9.08	50.00	40.22	0.29	0.41	Average
11	26.420	40.71	-19.29	60.00	39.60	0.49	0.62	QP
12	26.420	33.91	-16.09	50.00	32.80	0.49	0.62	Average

Neutral



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	@0.3050910	50.23	-9.87	60.10	50.08	0.08	0.07	QP
2	0.3050910	36.58	-13.52	50.10	36.43	0.08	0.07	Average
3	0.5435530	40.81	-15.19	56.00	40.62	0.09	0.10	QP
4	0.5435530	30.61	-15.39	46.00	30.42	0.09	0.10	Average
5	1.020	18.52	-27.48	46.00	18.28	0.10	0.14	Average
6	1.020	32.11	-23.89	56.00	31.87	0.10	0.14	QP
7	7.610	31.96	-28.04	60.00	31.39	0.23	0.34	QP
8	7.610	21.37	-28.63	50.00	20.80	0.23	0.34	Average
9	12.250	43.51	-16.49	60.00	42.79	0.30	0.42	QP
10	12.250	34.39	-15.61	50.00	33.67	0.30	0.42	Average
11	26.280	37.36	-22.64	60.00	36.23	0.51	0.62	QP
12	26.280	29.75	-20.25	50.00	28.62	0.51	0.62	Average

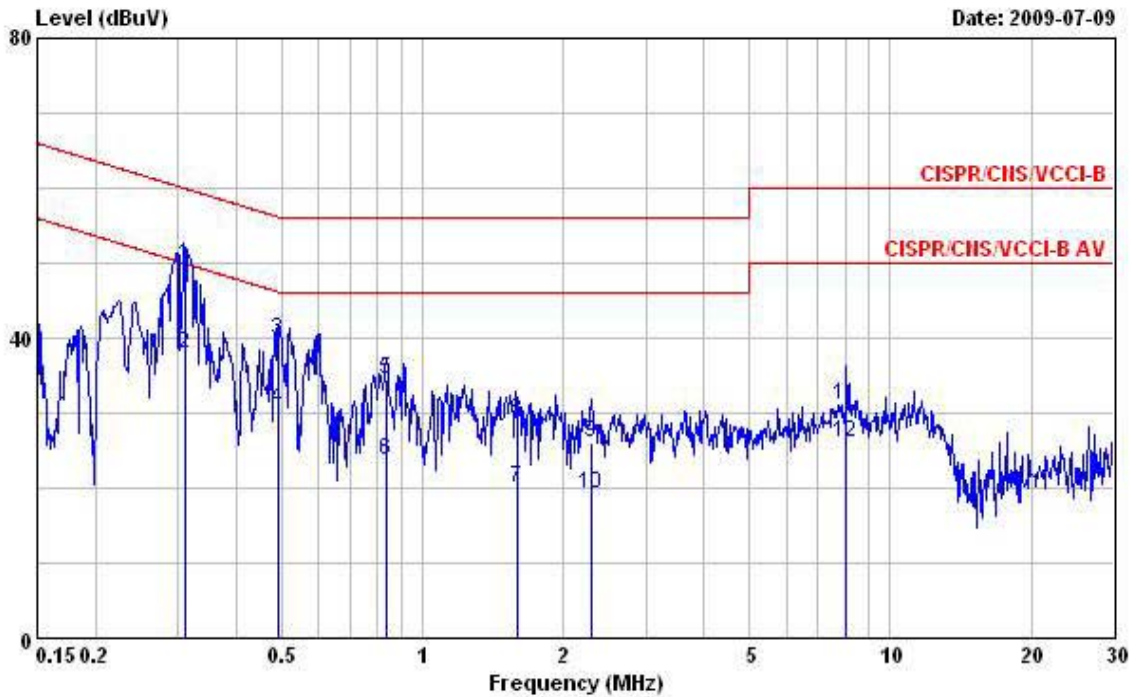
Note:

Level = Read Level + LISN Factor + Cable Loss.



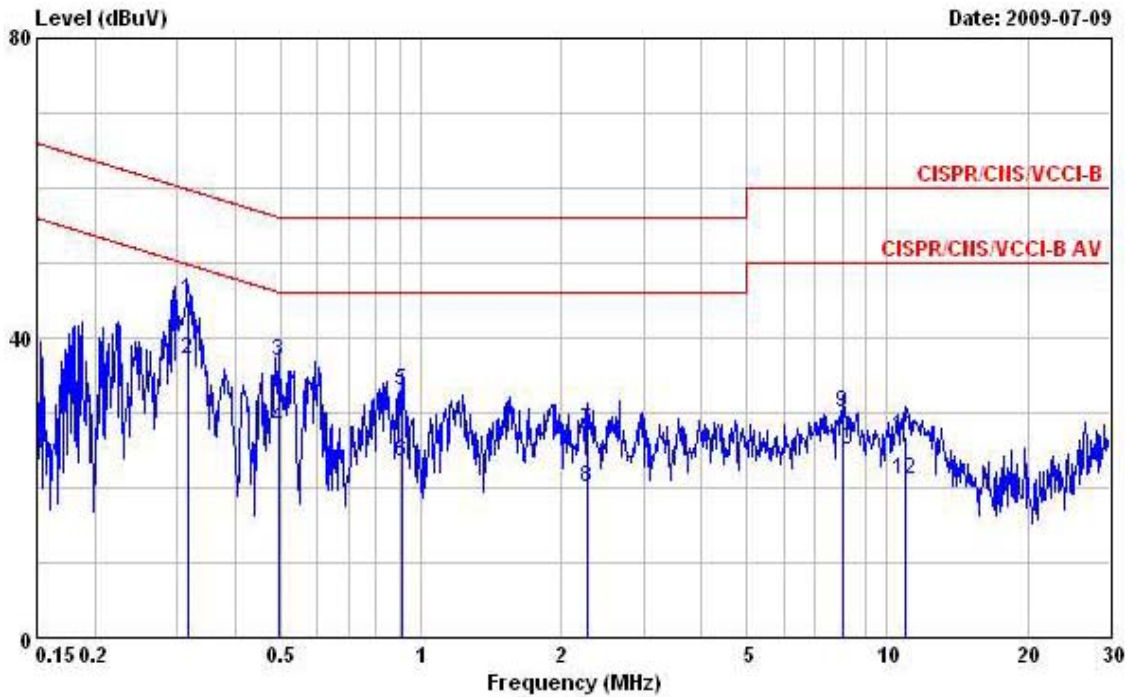
Final Test Date	Jul. 09, 2009	Test Site No.	CO04-HY
Temperature	25	Humidity	55%
Test Engineer	Chris	Configuration	Adapter Mode (DSA-20D-12 2)

Line



	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1	0.3099790	49.63	-10.34	59.97	49.47	0.09	0.07	QP
2	0.3099790	38.02	-11.95	49.97	37.86	0.09	0.07	Average
3	0.4914980	39.67	-16.47	56.14	39.49	0.09	0.09	QP
4	0.4914980	30.58	-15.56	46.14	30.40	0.09	0.09	Average
5	0.8393170	34.43	-21.57	56.00	34.19	0.11	0.13	QP
6	0.8393170	23.70	-22.30	46.00	23.46	0.11	0.13	Average
7	1.590	19.94	-26.06	46.00	19.65	0.12	0.17	Average
8	1.590	28.97	-27.03	56.00	28.68	0.12	0.17	QP
9	2.300	26.05	-29.95	56.00	25.72	0.14	0.19	QP
10	2.300	19.22	-26.78	46.00	18.89	0.14	0.19	Average
11	8.060	31.09	-28.91	60.00	30.50	0.24	0.35	QP
12	8.060	25.92	-24.08	50.00	25.33	0.24	0.35	Average

Neutral



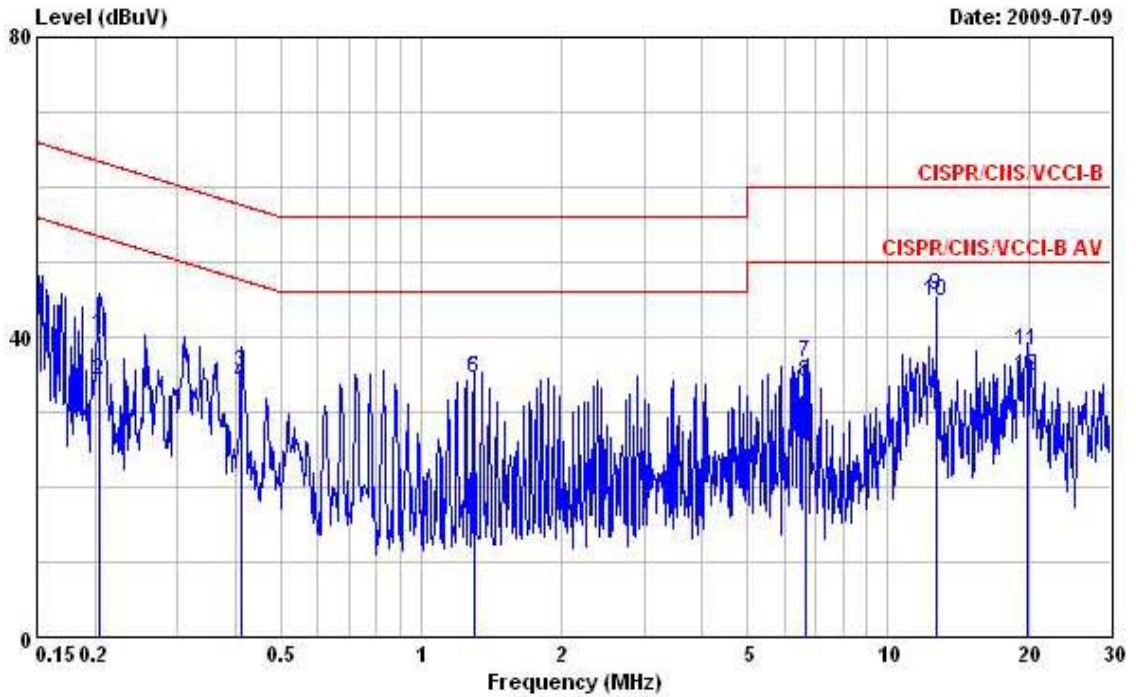
	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
			dB	dBuV	dBuV	dB	dB	
1	0.3166190	44.95	-14.85	59.80	44.80	0.08	0.07	QP
2	0.3166190	37.23	-12.57	49.80	37.08	0.08	0.07	Average
3	0.4941090	36.88	-19.22	56.10	36.71	0.08	0.09	QP
4	0.4941090	27.77	-18.33	46.10	27.60	0.08	0.09	Average
5	0.9135710	32.97	-23.03	56.00	32.74	0.10	0.13	QP
6	0.9135710	23.54	-22.46	46.00	23.31	0.10	0.13	Average
7	2.270	27.55	-28.45	56.00	27.24	0.12	0.19	QP
8	2.270	19.96	-26.04	46.00	19.65	0.12	0.19	Average
9	8.060	30.12	-29.88	60.00	29.54	0.23	0.35	QP
10	8.060	25.07	-24.93	50.00	24.49	0.23	0.35	Average
11	10.900	26.94	-33.06	60.00	26.26	0.28	0.40	QP
12	10.900	20.96	-29.04	50.00	20.28	0.28	0.40	Average

Note:

Level = Read Level + LISN Factor + Cable Loss.

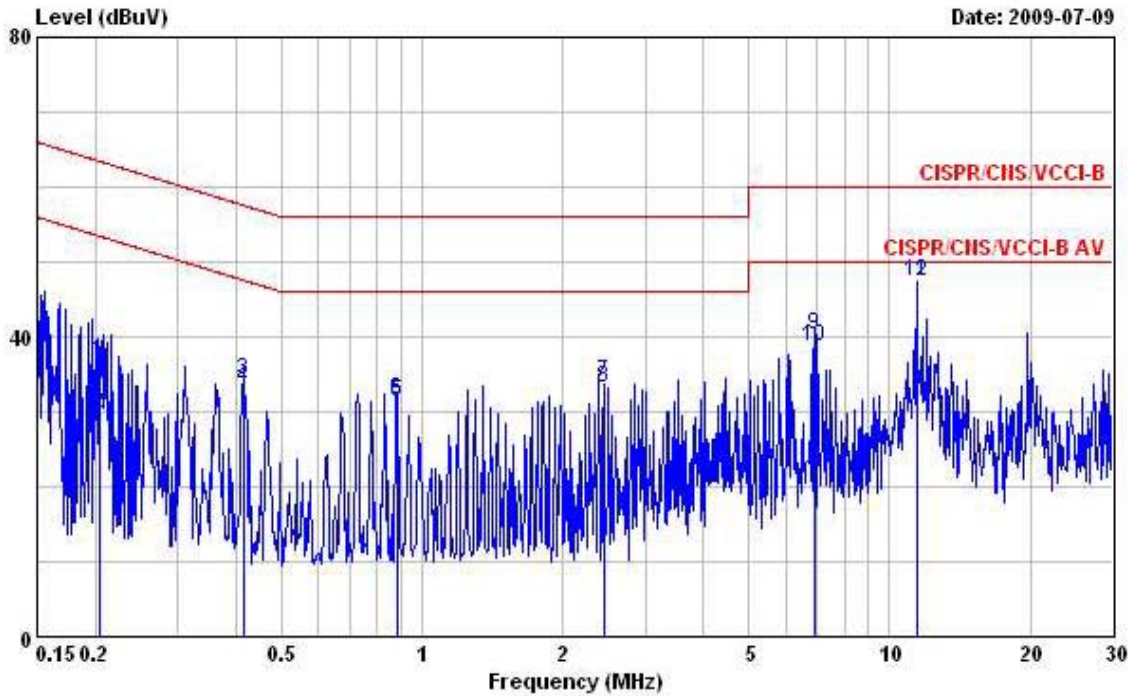
<b>Final Test Date</b>	Jul. 09, 2009	<b>Test Site No.</b>	CO04-HY
<b>Temperature</b>	25	<b>Humidity</b>	55%
<b>Test Engineer</b>	Chris	<b>Configuration</b>	POE Mode (Power Supply: POE20U-560(G) -R)

Line



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.2050460	40.38	-23.02	63.40	40.24	0.08	0.06	QP
2	0.2050460	34.28	-19.12	53.40	34.14	0.08	0.06	Average
3	0.4126560	35.19	-22.40	57.59	35.02	0.09	0.08	QP
4	0.4126560	33.57	-14.02	47.59	33.40	0.09	0.08	Average
5	1.296	34.43	-21.57	56.00	34.16	0.12	0.15	QP
6	1.296	34.34	-11.66	46.00	34.07	0.12	0.15	Average
7	6.688	36.48	-23.52	60.00	35.94	0.22	0.32	QP
8	6.688	33.87	-16.13	50.00	33.33	0.22	0.32	Average
9	12.709	45.48	-14.52	60.00	44.76	0.30	0.42	QP
10	12.709	44.64	-5.36	50.00	43.92	0.30	0.42	Average
11	19.966	38.16	-21.84	60.00	37.23	0.40	0.53	QP
12	19.966	34.86	-15.14	50.00	33.93	0.40	0.53	Average

Neutral



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.2040370	36.96	-26.48	63.44	36.82	0.08	0.06	QP
2	0.2040370	29.79	-23.65	53.44	29.65	0.08	0.06	Average
3	0.4148480	34.08	-23.47	57.55	33.92	0.08	0.08	QP
4	0.4148480	33.26	-14.29	47.55	33.10	0.08	0.08	Average
5	0.8836060	31.36	-14.64	46.00	31.13	0.10	0.13	Average
6	0.8836060	31.51	-24.49	56.00	31.28	0.10	0.13	QP
7	2.441	33.84	-22.16	56.00	33.52	0.12	0.20	QP
8	2.441	33.18	-12.82	46.00	32.86	0.12	0.20	Average
9	6.905	40.32	-19.68	60.00	39.78	0.22	0.32	QP
10	6.905	38.75	-11.25	50.00	38.21	0.22	0.32	Average
11	11.411	47.25	-12.75	60.00	46.57	0.28	0.40	QP
12	11.411	47.27	-2.73	50.00	46.59	0.28	0.40	Average

Note:

Level = Read Level + LISN Factor + Cable Loss.

**3.2 Maximum Conducted Output Power Measurement**

**3.2.1 Limit**

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. The limited has to be reduced by the amount in dB that the gain of the antenna exceed 6dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

**3.2.2 Measuring Instruments and Setting**

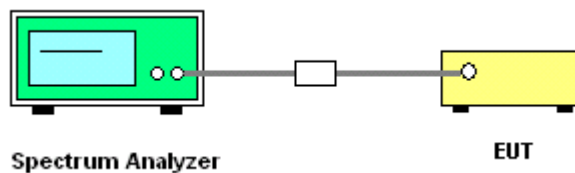
Please refer to section 4 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Power Meter Parameter	Setting
Attenuation	Auto
Span Frequency	Encompass the entire emissions bandwidth (EBW) of the signal
RB	1000 kHz
VB	3000 kHz
Detector	rms
Trace	Max Hold
Sweep Time	Auto

**3.2.3 Test Procedures**

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. Test was performed in accordance with Measurement of Digital Transmission Systems Operating under Section 15.247.
3. When measuring maximum conducted output power within multiple antenna systems, add every result of the values by mathematic formula.

**3.2.4 Test Setup Layout**



**3.2.5 Test Deviation**

There is no deviation with the original standard.

**3.2.6 EUT Operation during Test**

The EUT was programmed to be in continuously transmitting mode.

**3.2.7 Test Result of Maximum Conducted Output Power**

<b>Final Test Date</b>	Mar. 02, 2010	<b>Test Site No.</b>	TH01-HY
<b>Temperature</b>	24	<b>Humidity</b>	55%
<b>Test Engineer</b>	Duncan	<b>Configuration</b>	802.11n

**For Two Chain:**

**Configuration of IEEE 802.11n-5G Ant. A (20MHz)**

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	13.68	30.00	<b>Complies</b>
157	5785 MHz	13.05	30.00	<b>Complies</b>
165	5825 MHz	11.85	30.00	<b>Complies</b>

**Configuration of IEEE 802.11n-5G Ant. B (20MHz)**

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	11.57	30.00	<b>Complies</b>
157	5785 MHz	11.27	30.00	<b>Complies</b>
165	5825 MHz	10.15	30.00	<b>Complies</b>

**Configuration of IEEE 802.11n-5G Ant. A + Ant. B (20MHz)**

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	15.76	30.00	<b>Complies</b>
157	5785 MHz	15.26	30.00	<b>Complies</b>
165	5825 MHz	14.09	30.00	<b>Complies</b>

**Configuration of IEEE 802.11n-5G Ant. A (40MHz)**

<b>Channel</b>	<b>Frequency</b>	<b>Conducted Power (dBm)</b>	<b>Max. Limit (dBm)</b>	<b>Result</b>
151	5755 MHz	13.67	30.00	<b>Complies</b>
159	5795 MHz	13.41	30.00	<b>Complies</b>

**Configuration of IEEE 802.11n-5G Ant. B (40MHz)**

<b>Channel</b>	<b>Frequency</b>	<b>Conducted Power (dBm)</b>	<b>Max. Limit (dBm)</b>	<b>Result</b>
151	5755 MHz	11.87	30.00	<b>Complies</b>
159	5795 MHz	12.05	30.00	<b>Complies</b>

**Configuration of IEEE 802.11n-5G Ant. A + Ant. B (40MHz)**

<b>Channel</b>	<b>Frequency</b>	<b>Conducted Power (dBm)</b>	<b>Max. Limit (dBm)</b>	<b>Result</b>
151	5755 MHz	15.87	30.00	<b>Complies</b>
159	5795 MHz	15.79	30.00	<b>Complies</b>

**Configuration of IEEE 802.11n-2.4G Ant. A (20MHz)**

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	13.12	30.00	<b>Complies</b>
6	2437 MHz	21.26	30.00	<b>Complies</b>
11	2462 MHz	11.59	30.00	<b>Complies</b>

**Configuration of IEEE 802.11n-2.4G Ant. B (20MHz)**

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	14.29	30.00	<b>Complies</b>
6	2437 MHz	22.17	30.00	<b>Complies</b>
11	2462 MHz	11.31	30.00	<b>Complies</b>

**Configuration of IEEE 802.11n-2.4G Ant. A + Ant. B (20MHz)**

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	16.75	30.00	<b>Complies</b>
6	2437 MHz	24.75	30.00	<b>Complies</b>
11	2462 MHz	14.46	30.00	<b>Complies</b>



**Configuration of IEEE 802.11n-2.4G Ant. A (40MHz)**

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
3	2422 MHz	7.01	30.00	<b>Complies</b>
6	2437 MHz	21.45	30.00	<b>Complies</b>
9	2452 MHz	7.91	30.00	<b>Complies</b>

**Configuration of IEEE 802.11n-2.4G Ant. B (40MHz)**

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
3	2422 MHz	8.76	30.00	<b>Complies</b>
6	2437 MHz	22.37	30.00	<b>Complies</b>
9	2452 MHz	8.10	30.00	<b>Complies</b>

**Configuration of IEEE 802.11n-2.4G Ant. A + Ant. B (40MHz)**

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
3	2422 MHz	10.98	30.00	<b>Complies</b>
6	2437 MHz	24.94	30.00	<b>Complies</b>
9	2452 MHz	11.02	30.00	<b>Complies</b>

**3.3 Power Spectral Density Measurement**

**3.3.1 Limit**

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

**3.3.2 Measuring Instruments and Setting**

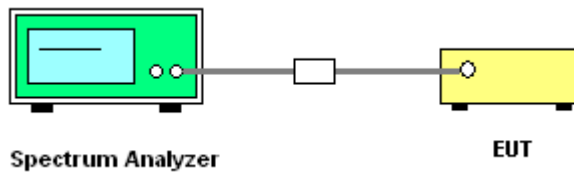
Please refer to section 4 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	1.5MHz
RB	3 kHz
VB	30 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	500s

**3.3.3 Test Procedures**

1. The transmitter output (antenna port) was connected to the spectrum analyser.
2. Set RBW of spectrum analyzer to 3kHz and VBW to 30kHz. Set Detector to Peak, Trace to Max Hold.
3. Mark the frequency with maximum peak power as the center of the display of the spectrum.
4. Set the span to 1.5MHz and the sweep time to 500s and record the maximum peak value.
5. Measuring multiple antennas, the connectors are required to link with Spectrum Analyzer through a combiner.

**3.3.4 Test Setup Layout**



**3.3.5 Test Deviation**

There is no deviation with the original standard.

**3.3.6 EUT Operation during Test**

The EUT was programmed to be in continuously transmitting mode.

**3.3.7 Test Result of Power Spectral Density**

<b>Final Test Date</b>	Mar. 02, 2010	<b>Test Site No.</b>	TH01-HY
<b>Temperature</b>	24	<b>Humidity</b>	55%
<b>Test Engineer</b>	Duncan	<b>Configuration</b>	802.11n

**For Two Chain:**

**Configuration of IEEE 802.11n-5G Ant. A + Ant. B (20MHz)**

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	-8.43	8.00	<b>Complies</b>
157	5785 MHz	-10.49	8.00	<b>Complies</b>
165	5825 MHz	-10.94	8.00	<b>Complies</b>

**Configuration of IEEE 802.11n-5G Ant. A + Ant. B (40MHz)**

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
151	5755 MHz	-11.22	8.00	<b>Complies</b>
159	5795 MHz	-12.35	8.00	<b>Complies</b>

**Configuration of IEEE 802.11n-2.4G Ant. A + Ant. B (20MHz)**

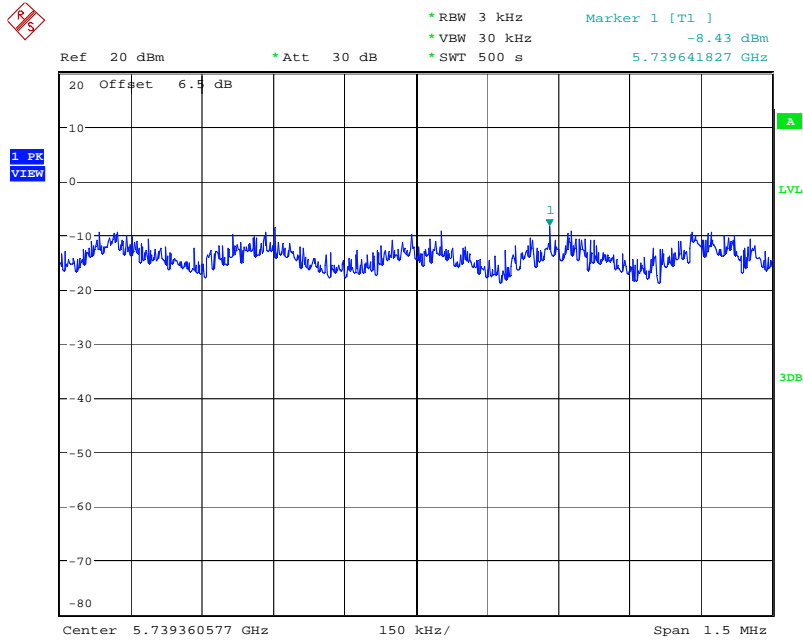
Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	-12.01	8.00	<b>Complies</b>
6	2437 MHz	-4.43	8.00	<b>Complies</b>
11	2462 MHz	-14.57	8.00	<b>Complies</b>

**Configuration of IEEE 802.11n-2.4G Ant. A + Ant. B (40MHz)**

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
3	2422 MHz	-20.92	8.00	<b>Complies</b>
6	2437 MHz	-7.50	8.00	<b>Complies</b>
9	2452 MHz	-19.48	8.00	<b>Complies</b>

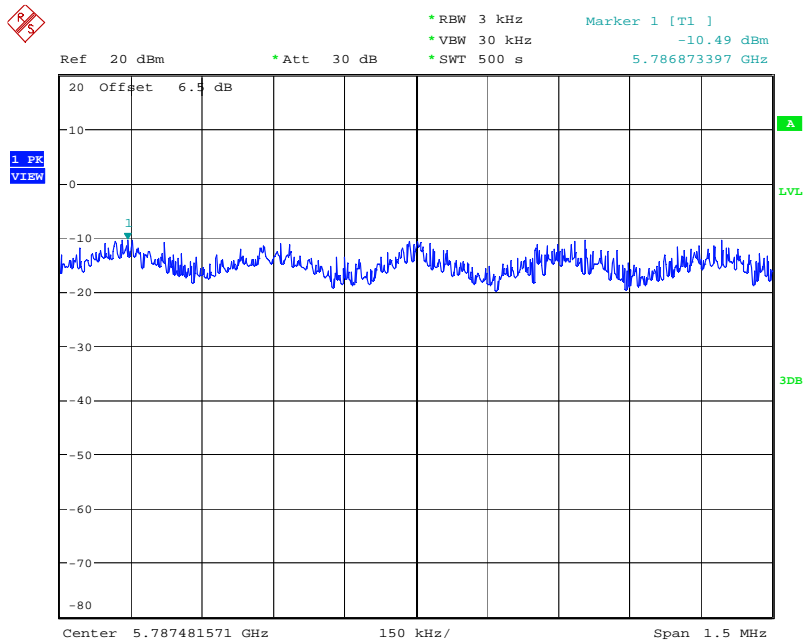
For Two Chain:

Power Density Plot on Configuration of IEEE 802.11n-5G Ant. A + Ant. B (20MHz) / 5745 MHz



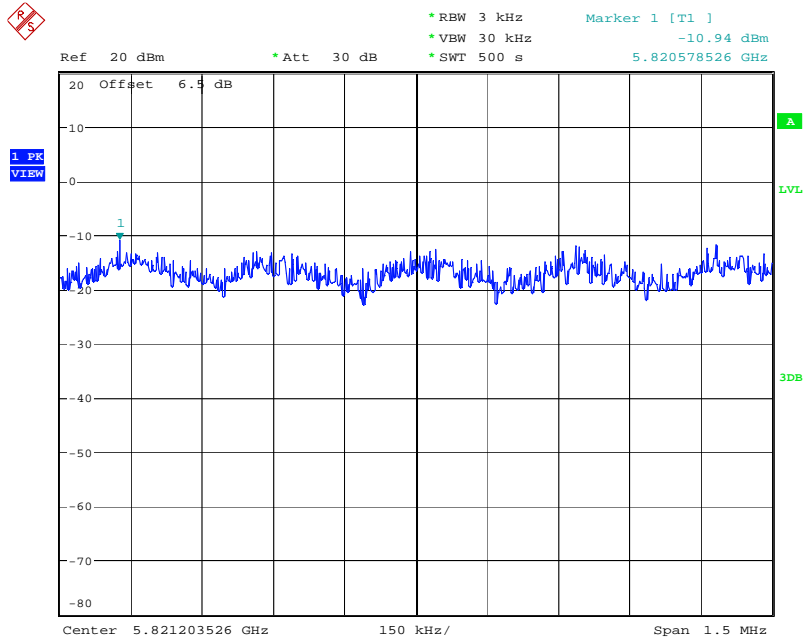
Date: 2.MAR.2010 14:16:51

Power Density Plot on Configuration of IEEE 802.11n-5G Ant. A + Ant. B (20MHz) / 5785 MHz



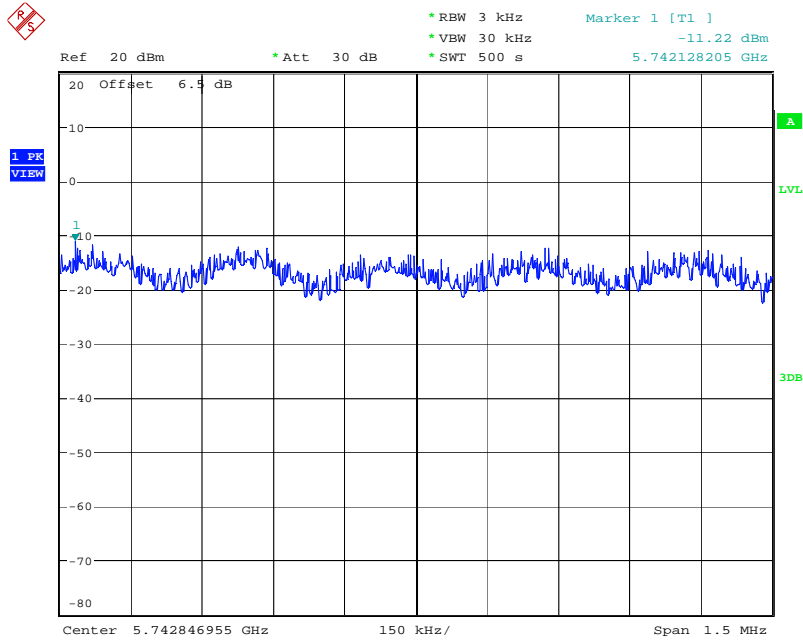
Date: 2.MAR.2010 14:28:48

Power Density Plot on Configuration of IEEE 802.11n-5G Ant. A + Ant. B (20MHz) / 5825 MHz



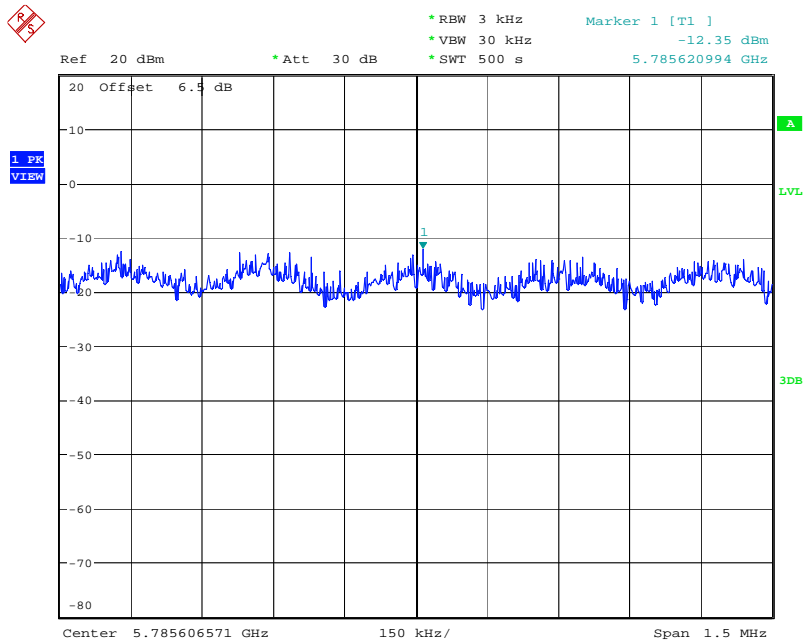
Date: 2.MAR.2010 14:27:03

Power Density Plot on Configuration of IEEE 802.11n-5G Ant. A + Ant. B (40MHz) / 5755 MHz



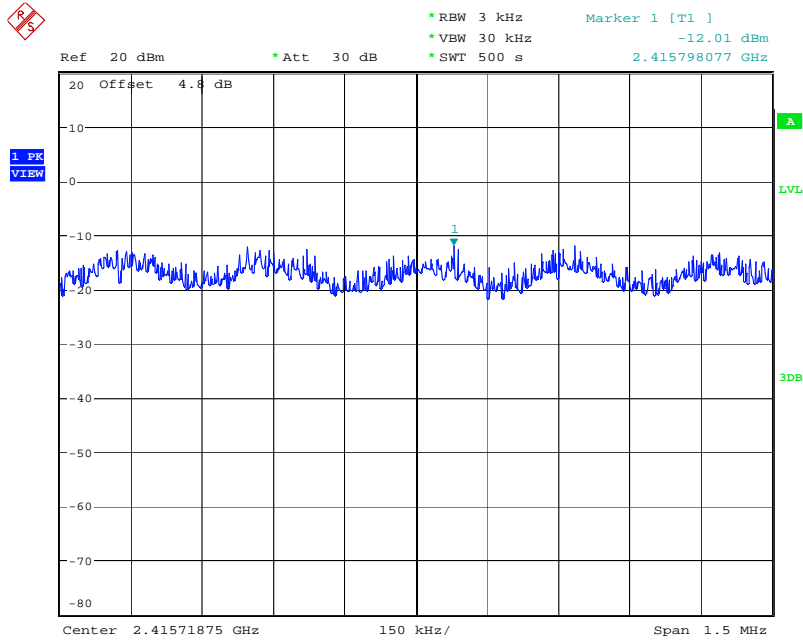
Date: 2.MAR.2010 14:18:40

Power Density Plot on Configuration of IEEE 802.11n-5G Ant. A + Ant. B (40MHz) / 5795 MHz



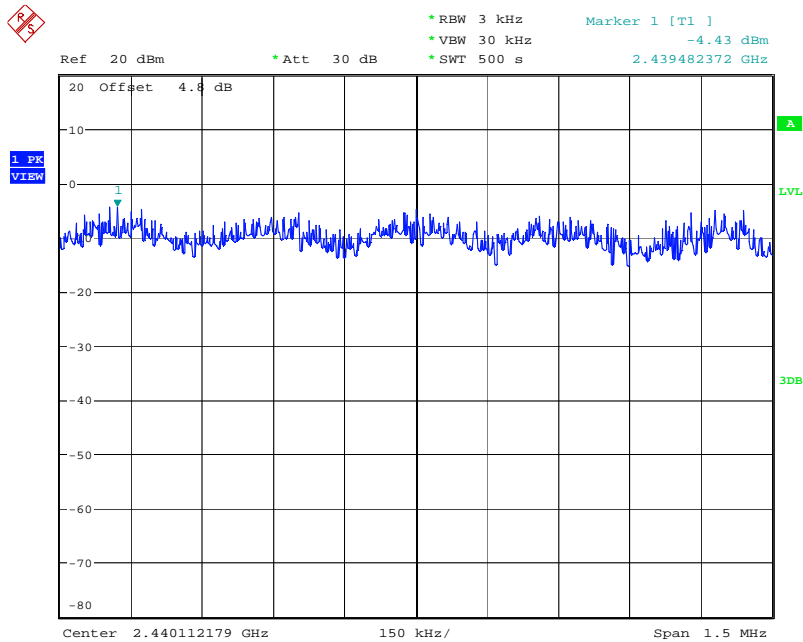
Date: 2.MAR.2010 14:21:57

Power Density Plot on Configuration of IEEE 802.11n-2.4G Ant. A + Ant. B (20MHz) / 2412 MHz



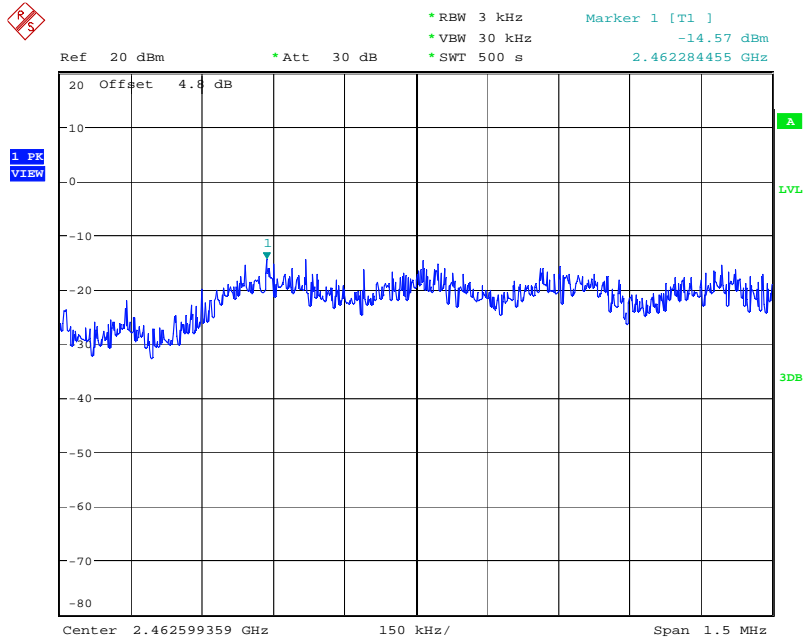
Date: 1.MAR.2010 19:52:18

Power Density Plot on Configuration of IEEE 802.11n-2.4G Ant. A + Ant. B (20MHz) / 2437 MHz



Date: 1.MAR.2010 19:53:56

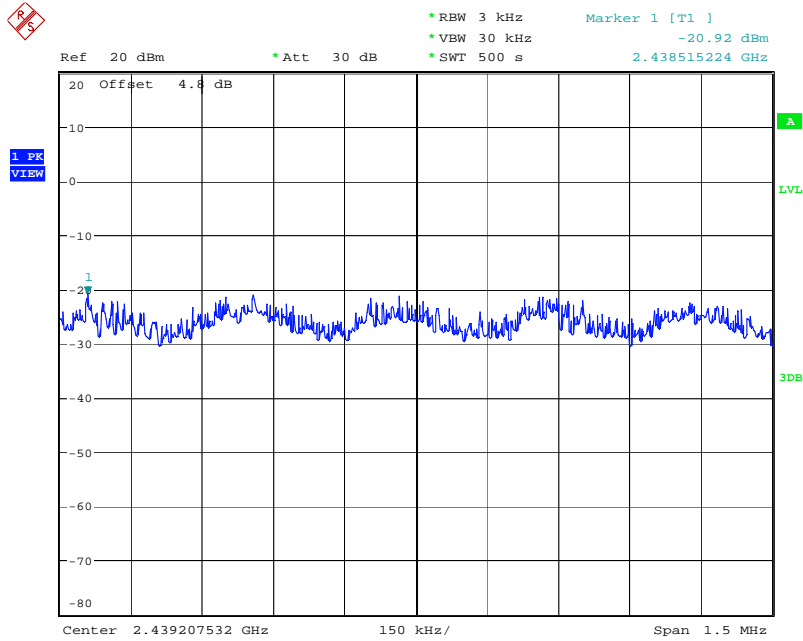
Power Density Plot on Configuration of IEEE 802.11n-2.4G Ant. A + Ant. B (20MHz) / 2462 MHz



Date: 1.MAR.2010 19:54:57

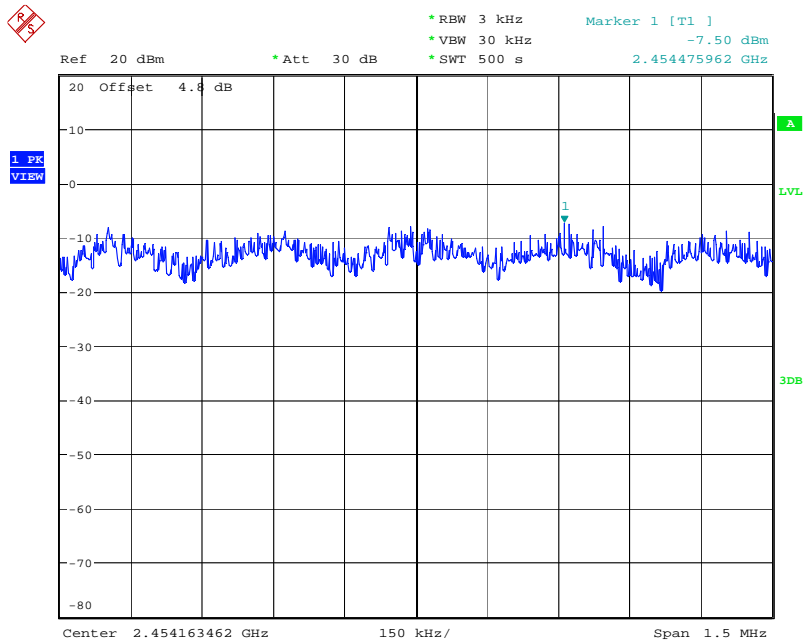


Power Density Plot on Configuration of IEEE 802.11n-2.4G Ant. A + Ant. B (40MHz) / 2422 MHz



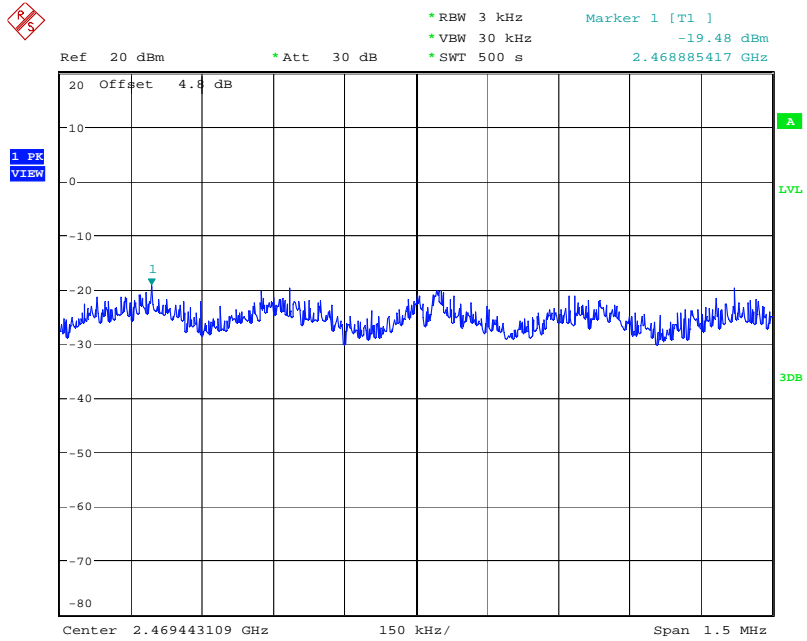
Date: 1.MAR.2010 19:57:26

Power Density Plot on Configuration of IEEE 802.11n-2.4G Ant. A + Ant. B (40MHz) / 2437 MHz



Date: 1.MAR.2010 19:59:25

Power Density Plot on Configuration of IEEE 802.11n-2.4G Ant. A + Ant. B (40MHz) / 2452 MHz



Date: 1.MAR.2010 20:00:33

**3.4 6dB Spectrum Bandwidth Measurement**

**3.4.1 Limit**

For digital modulation systems, the minimum 6dB bandwidth shall be at least 500 kHz.

**3.4.2 Measuring Instruments and Setting**

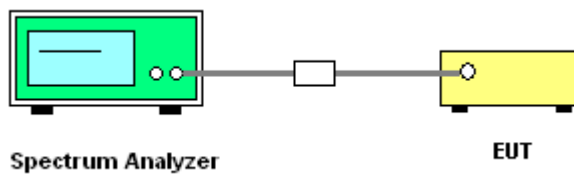
Please refer to section 4 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> 6dB Bandwidth
RB	100 kHz
VB	100 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

**3.4.3 Test Procedures**

1. The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.
2. The resolution bandwidth of 100 kHz and the video bandwidth of 100 kHz were used.
3. Measured the spectrum width with power higher than 6dB below carrier.
4. Measuring multiple antennas, the connectors are required to link with Spectrum Analyzer through a combiner.

**3.4.4 Test Setup Layout**



**3.4.5 Test Deviation**

There is no deviation with the original standard.

**3.4.6 EUT Operation during Test**

The EUT was programmed to be in continuously transmitting mode.

**3.4.7 Test Result of 6dB Spectrum Bandwidth**

<b>Final Test Date</b>	Mar. 02, 2010	<b>Test Site No.</b>	TH01-HY
<b>Temperature</b>	24	<b>Humidity</b>	55%
<b>Test Engineer</b>	Duncan	<b>Configuration</b>	802.11n

**For Two Chain:**

**Configuration of IEEE 802.11n-5G Ant. A + Ant. B (20MHz)**

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	16.03	17.60	500	<b>Complies</b>
157	5785 MHz	15.42	17.56	500	<b>Complies</b>
165	5825 MHz	15.74	17.53	500	<b>Complies</b>

**Configuration of IEEE 802.11n-5G Ant. A + Ant. B (40MHz)**

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
151	5755 MHz	34.49	36.28	500	<b>Complies</b>
159	5795 MHz	34.42	36.28	500	<b>Complies</b>

**Configuration of IEEE 802.11n-2.4G Ant. A + Ant. B (20MHz)**

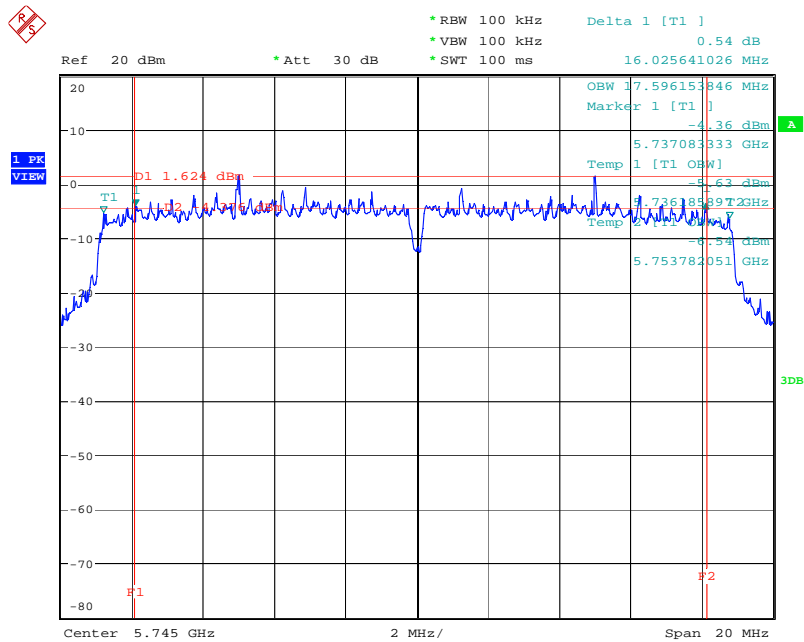
Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	16.28	17.60	500	<b>Complies</b>
6	2437 MHz	14.46	17.56	500	<b>Complies</b>
11	2462 MHz	15.99	17.56	500	<b>Complies</b>

**Configuration of IEEE 802.11n-2.4G Ant. A + Ant. B (40MHz)**

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
3	2422 MHz	34.42	36.22	500	<b>Complies</b>
6	2437 MHz	34.10	36.28	500	<b>Complies</b>
9	2452 MHz	35.71	36.28	500	<b>Complies</b>

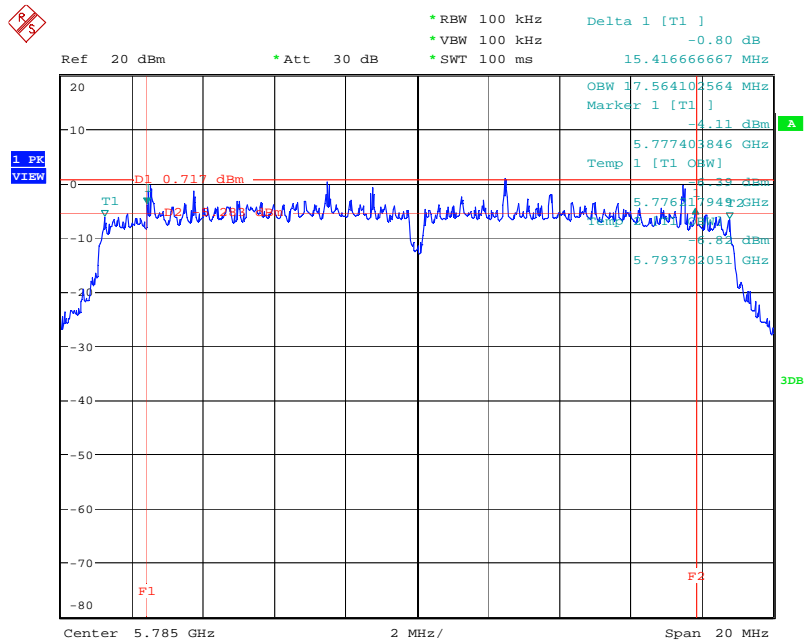
For Two Chain:

6 dB Bandwidth Plot on Configuration of IEEE 802.11n-5G Ant. A + Ant. B (20MHz) / 5745 MHz



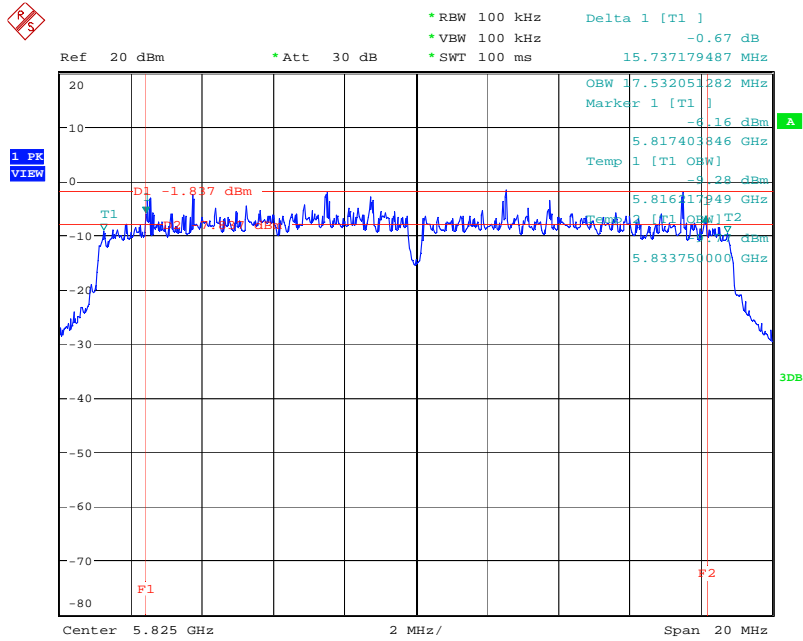
Date: 2.MAR.2010 14:17:01

6 dB Bandwidth Plot on Configuration of IEEE 802.11n-5G Ant. A + Ant. B (20MHz) / 5785 MHz



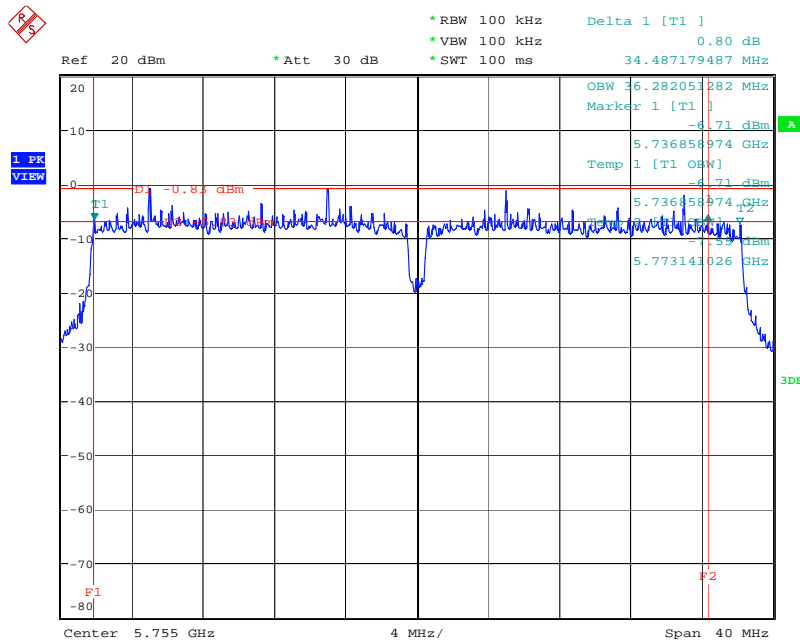
Date: 2.MAR.2010 14:28:58

6 dB Bandwidth Plot on Configuration of IEEE 802.11n-5G Ant. A + Ant. B (20MHz) / 5825 MHz



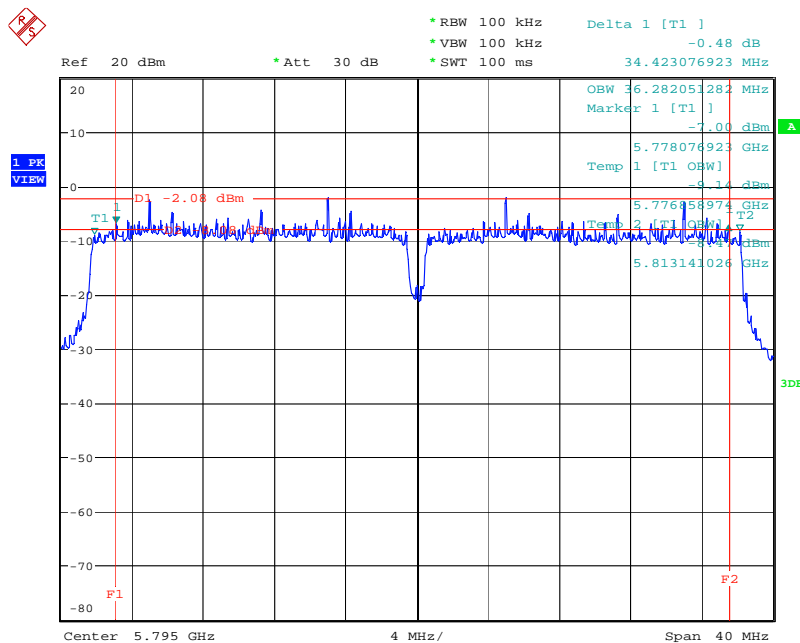
Date: 2.MAR.2010 14:27:13

6 dB Bandwidth Plot on Configuration of IEEE 802.11n-5G Ant. A + Ant. B (40MHz) / 5755 MHz



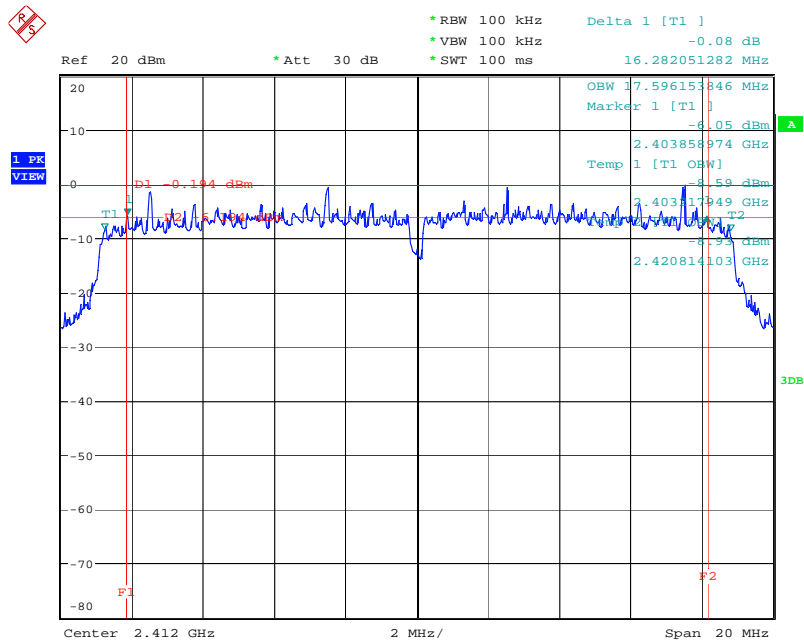
Date: 2.MAR.2010 14:18:51

6 dB Bandwidth Plot on Configuration of IEEE 802.11n-5G Ant. A + Ant. B (40MHz) / 5795 MHz



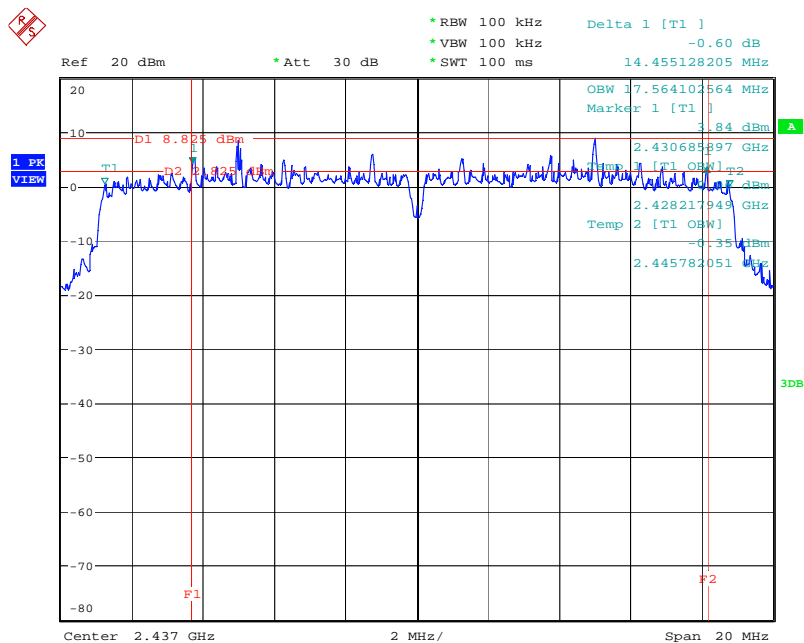
Date: 2.MAR.2010 14:22:08

6 dB Bandwidth Plot on Configuration of IEEE 802.11n-2.4G Ant. A + Ant. B (20MHz) / 2412 MHz



Date: 1.MAR.2010 19:52:29

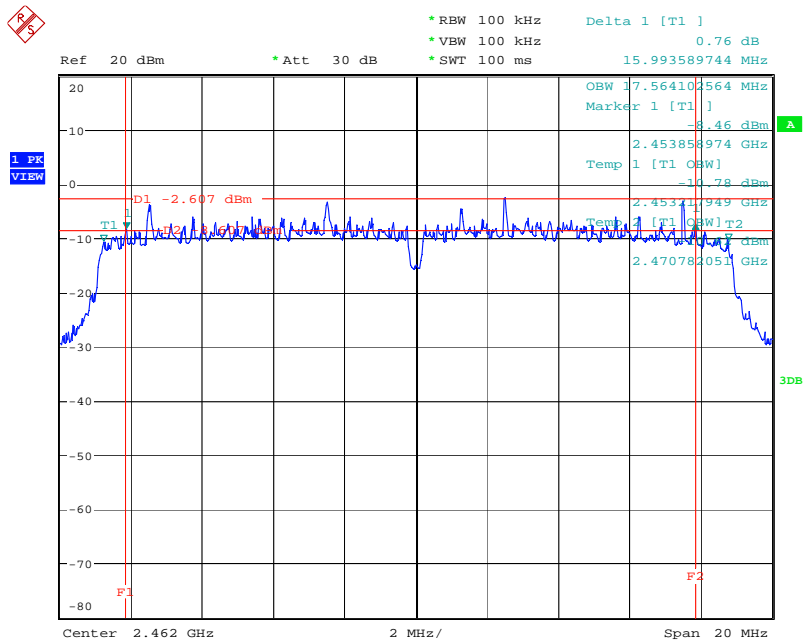
6 dB Bandwidth Plot on Configuration of IEEE 802.11n-2.4G Ant. A + Ant. B (20MHz) / 2437 MHz



Date: 1.MAR.2010 19:54:06

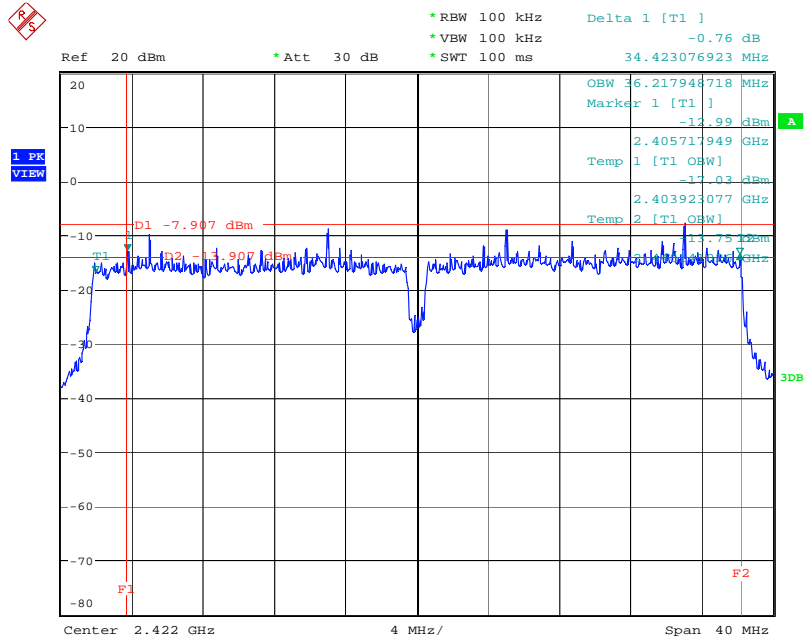


6 dB Bandwidth Plot on Configuration of IEEE 802.11n-2.4G Ant. A + Ant. B (20MHz) / 2462 MHz



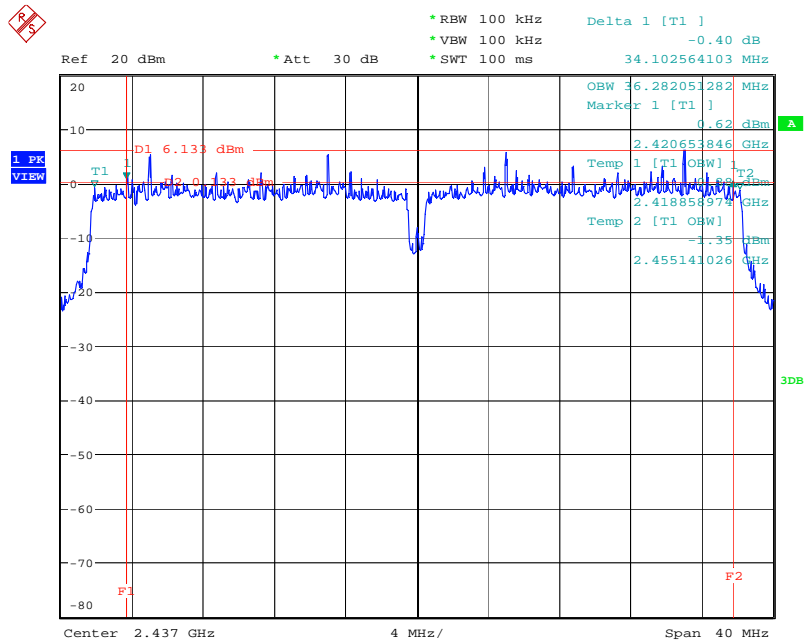
Date: 1.MAR.2010 19:55:08

6 dB Bandwidth Plot on Configuration of IEEE 802.11n-2.4G Ant. A + Ant. B (40MHz) / 2422 MHz



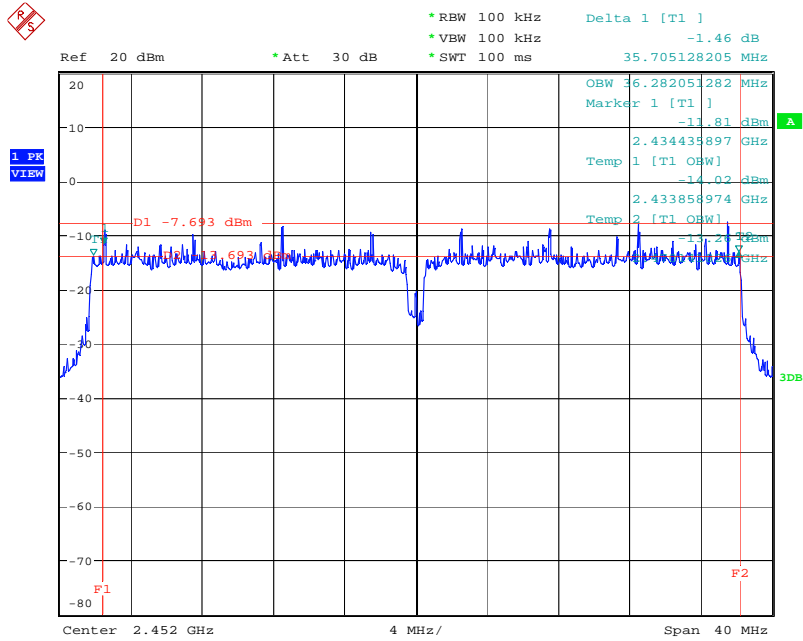
Date: 1.MAR.2010 19:57:37

6 dB Bandwidth Plot on Configuration of IEEE 802.11n-2.4G Ant. A + Ant. B (40MHz) / 2437 MHz



Date: 1.MAR.2010 19:59:35

6 dB Bandwidth Plot on Configuration of IEEE 802.11n-2.4G Ant. A + Ant. B (40MHz) / 2452 MHz



Date: 1.MAR.2010 20:00:44

**3.5 Radiated Emissions Measurement**

**3.5.1 Limit**

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

<b>Frequencies (MHz)</b>	<b>Field Strength (microrvolts/meter)</b>	<b>Measurement Distance (meters)</b>
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

**3.5.2 Measuring Instruments and Setting**

Please refer to section 4 of equipments list in this report. The following table is the setting of spectrum analyzer and receiver.

<b>Spectrum Parameter</b>	<b>Setting</b>
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average
RB / VB (Emission in non-restricted band)	1MHz / 1MHz for peak

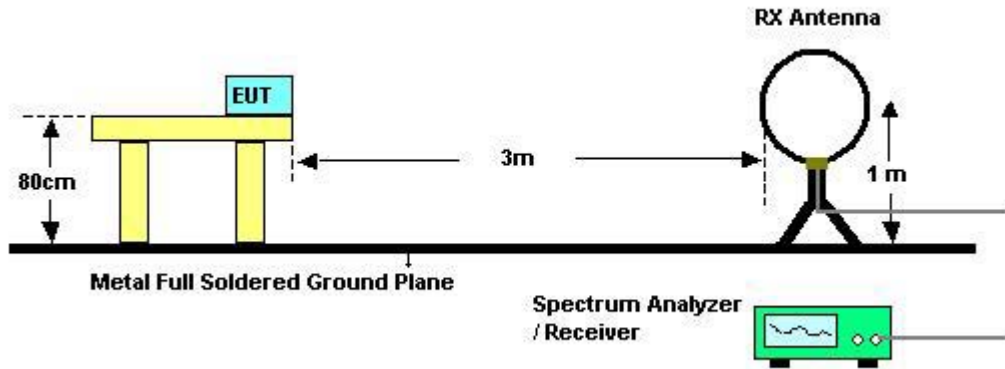
<b>Receiver Parameter</b>	<b>Setting</b>
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

**3.5.3 Test Procedures**

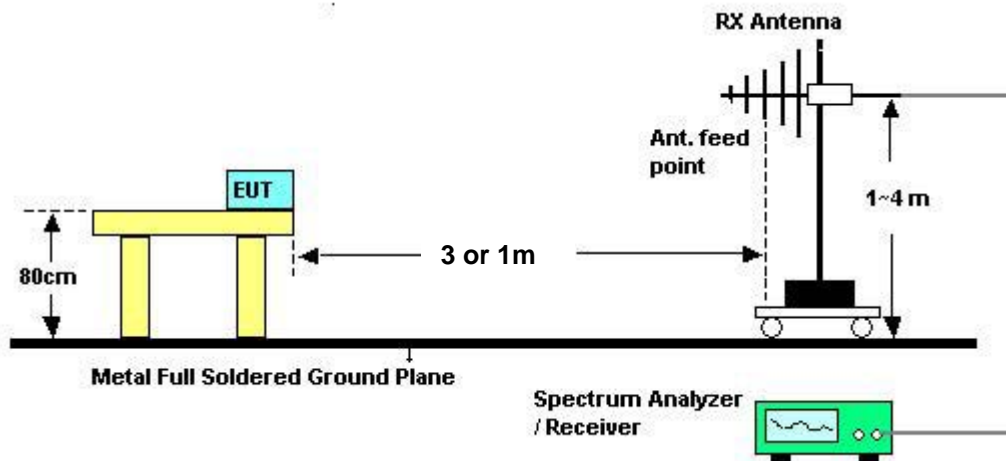
1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

3.5.4 Test Setup Layout

For radiated emissions below 30MHz



For radiated emissions above 30MHz



Above 10 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1m.

Distance extrapolation factor =  $20 \log (\text{specific distance [3m]} / \text{test distance [1m]})$  (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [9.54 dB].

3.5.5 Test Deviation

There is no deviation with the original standard.

3.5.6 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

**3.5.7 Results of Radiated Emissions (9kHz~30MHz)**

<b>Final Test Date</b>	Feb. 23 2010	<b>Test Site No.</b>	OS04-LK
<b>Temperature</b>	24	<b>Humidity</b>	56%
<b>Test Engineer</b>	Benny		

<b>Freq. (MHz)</b>	<b>Level (dBuV)</b>	<b>Over Limit (dB)</b>	<b>Limit Line (dBuV)</b>	<b>Remark</b>
-	-	-	-	See Note

Note:

The amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

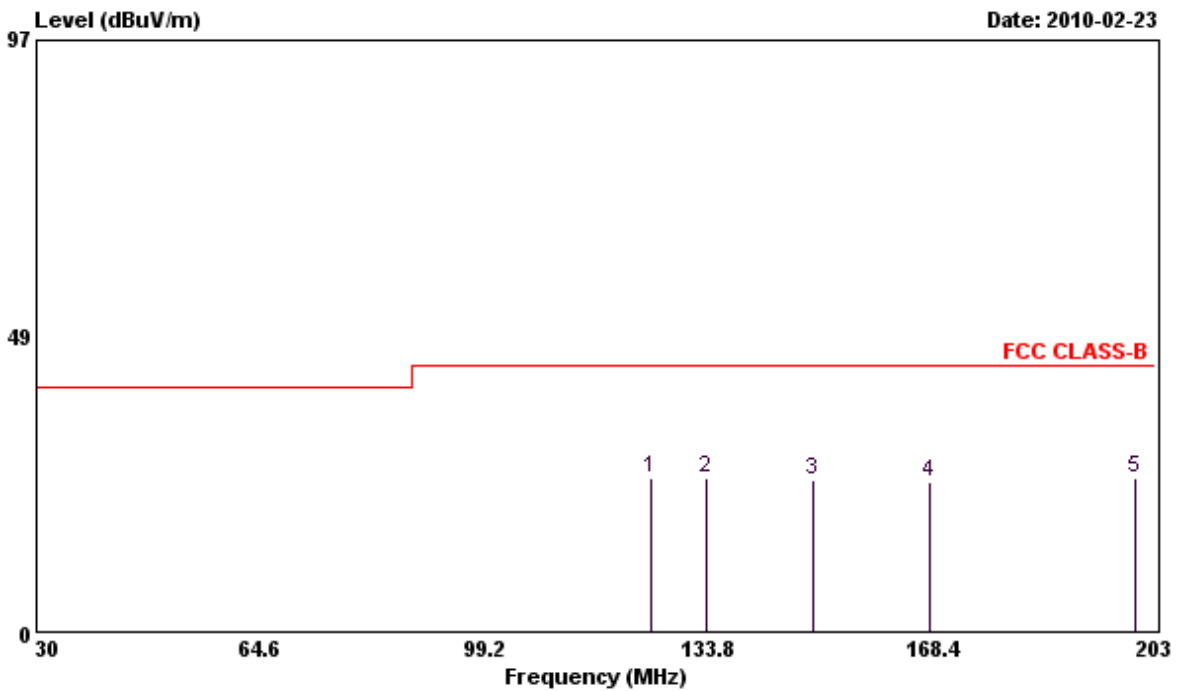
Distance extrapolation factor =  $40 \log (\text{specific distance} / \text{test distance})$  (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor.

**3.5.8 Results of Radiated Emissions (30MHz~1GHz)**

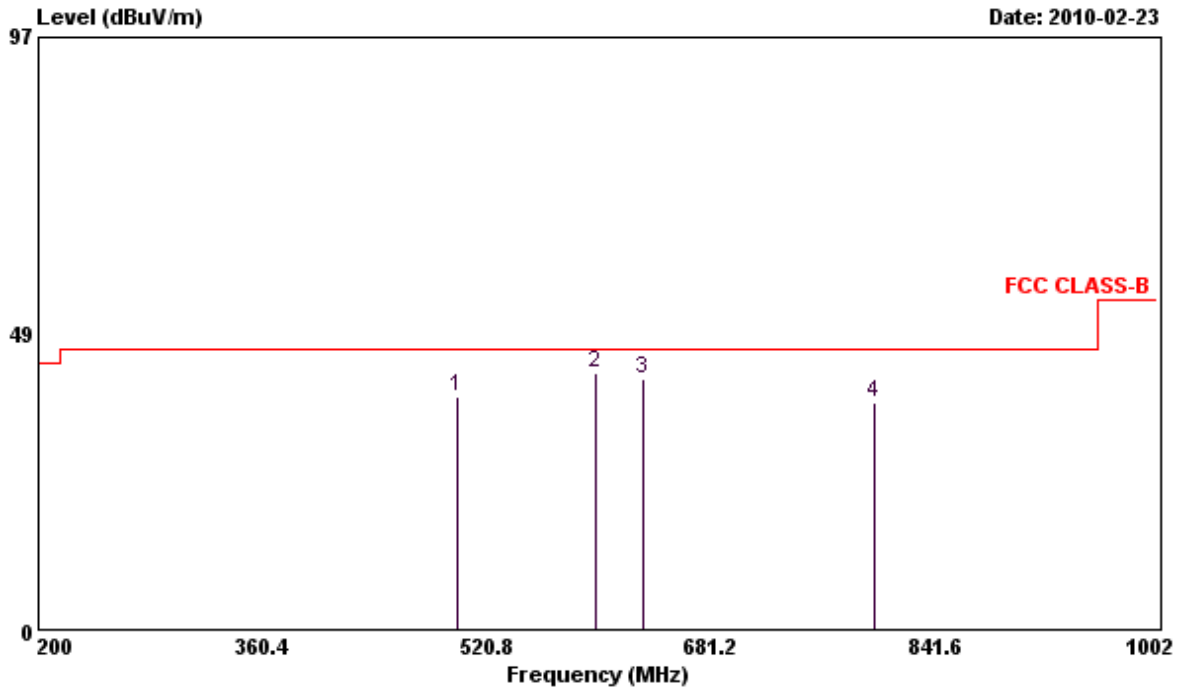
<b>Final Test Date</b>	Feb. 23 2010	<b>Test Site No.</b>	OS04-LK
<b>Temperature</b>	24	<b>Humidity</b>	56%
<b>Test Engineer</b>	Benny	<b>Configuration</b>	POE Mode (Power Supply: POE20U-560(G) -R)

**Horizontal**



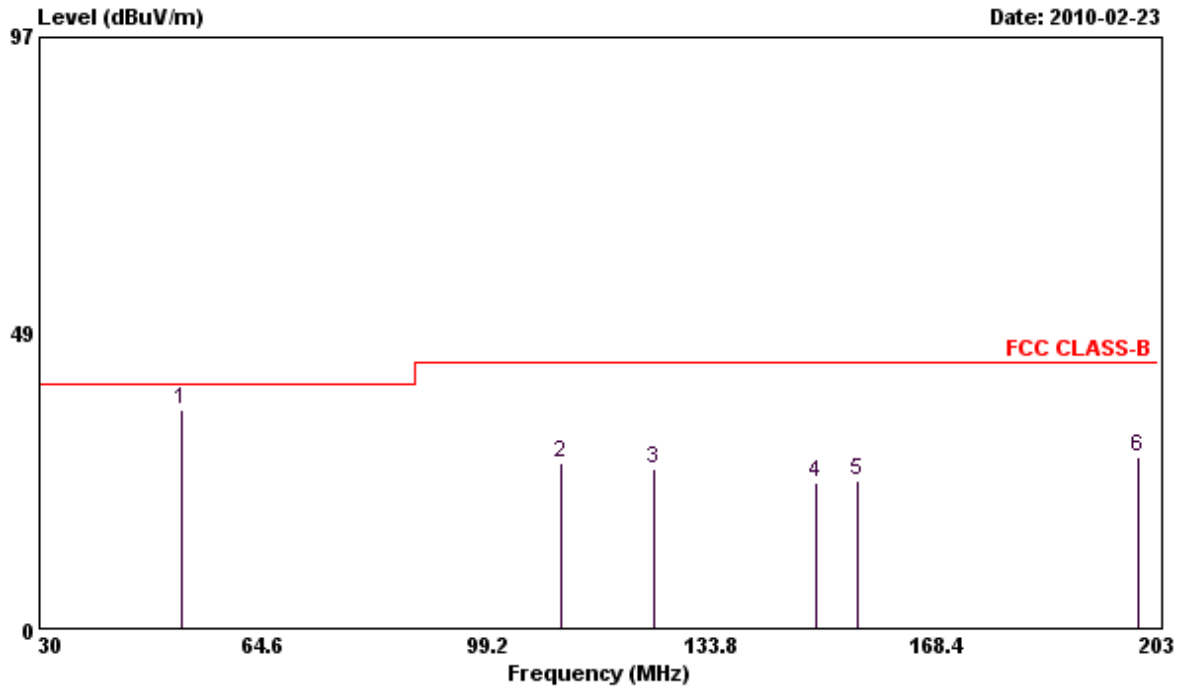
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	125.000	25.33	-18.17	43.50	37.34	11.41	1.58	25.00	Peak	---	---
2	133.630	25.12	-18.38	43.50	37.16	11.29	1.67	25.00	Peak	---	---
3	150.000	24.89	-18.61	43.50	37.10	11.05	1.74	25.00	Peak	---	---
4	168.050	24.64	-18.86	43.50	38.77	9.01	1.86	25.00	Peak	---	---
5	200.000	25.20	-18.30	43.50	39.22	8.95	2.03	25.00	Peak	---	---



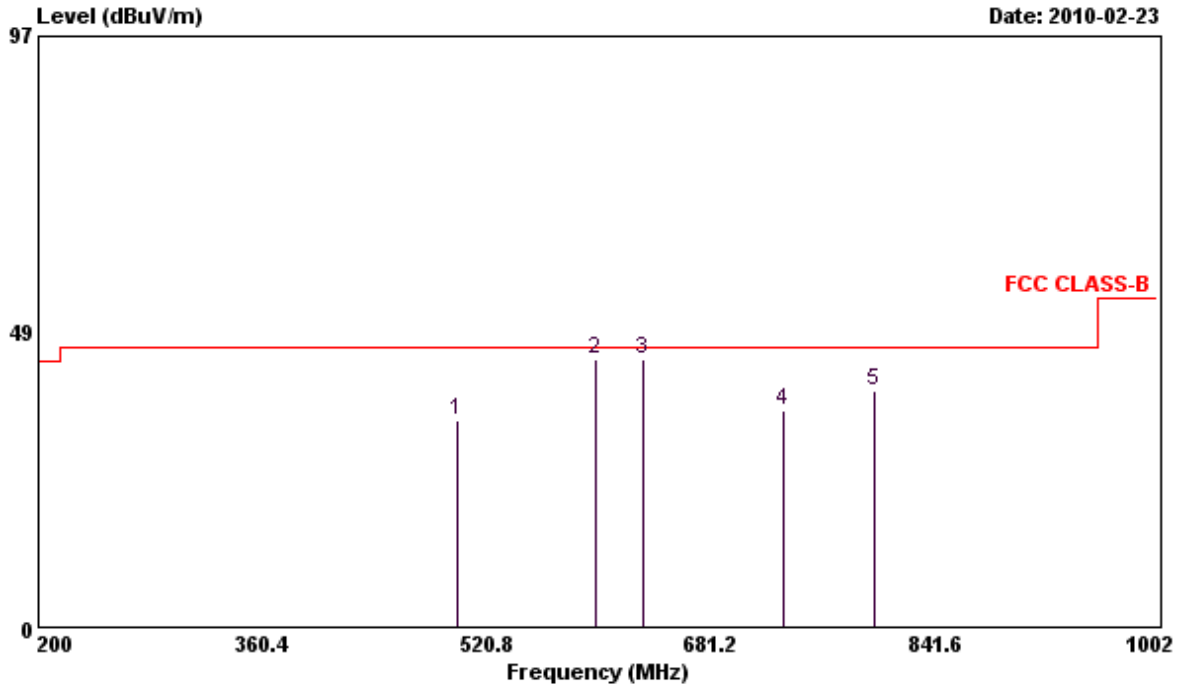


	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	500.000	38.18	-7.82	46.00	43.38	16.43	3.37	25.00	Peak	---	---
2	600.000	42.15	-3.85	46.00	45.67	17.72	3.86	25.10	QP	---	---
3	633.300	41.10	-4.90	46.00	44.37	17.88	3.95	25.10	Peak	---	---
4	800.000	37.27	-8.73	46.00	38.80	19.07	4.60	25.20	Peak	---	---

Vertical



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	52.000	35.94	-4.06	40.00	51.99	7.92	0.93	24.90	Peak	---	---
2	110.620	27.21	-16.29	43.50	39.83	10.90	1.48	25.00	Peak	---	---
3	125.000	26.26	-17.24	43.50	38.27	11.41	1.58	25.00	Peak	---	---
4	150.000	23.89	-19.61	43.50	36.10	11.05	1.74	25.00	Peak	---	---
5	156.600	24.29	-19.21	43.50	37.79	9.71	1.79	25.00	Peak	---	---
6	200.000	28.08	-15.42	43.50	42.10	8.95	2.03	25.00	Peak	---	---



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	500.000	33.98	-12.02	46.00	39.18	16.43	3.37	25.00	Peak	---	---
2 @	600.000	44.06	-1.94	46.00	47.58	17.72	3.86	25.10	QP	140	360
3	633.300	43.98	-2.02	46.00	47.25	17.88	3.95	25.10	QP	---	---
4	734.000	35.67	-10.33	46.00	37.99	18.49	4.32	25.13	Peak	---	---
5	800.000	38.72	-7.28	46.00	40.25	19.07	4.60	25.20	Peak	---	---

Note:

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

Emission level (dBuV/m) = 20 log Emission level (uV/m).

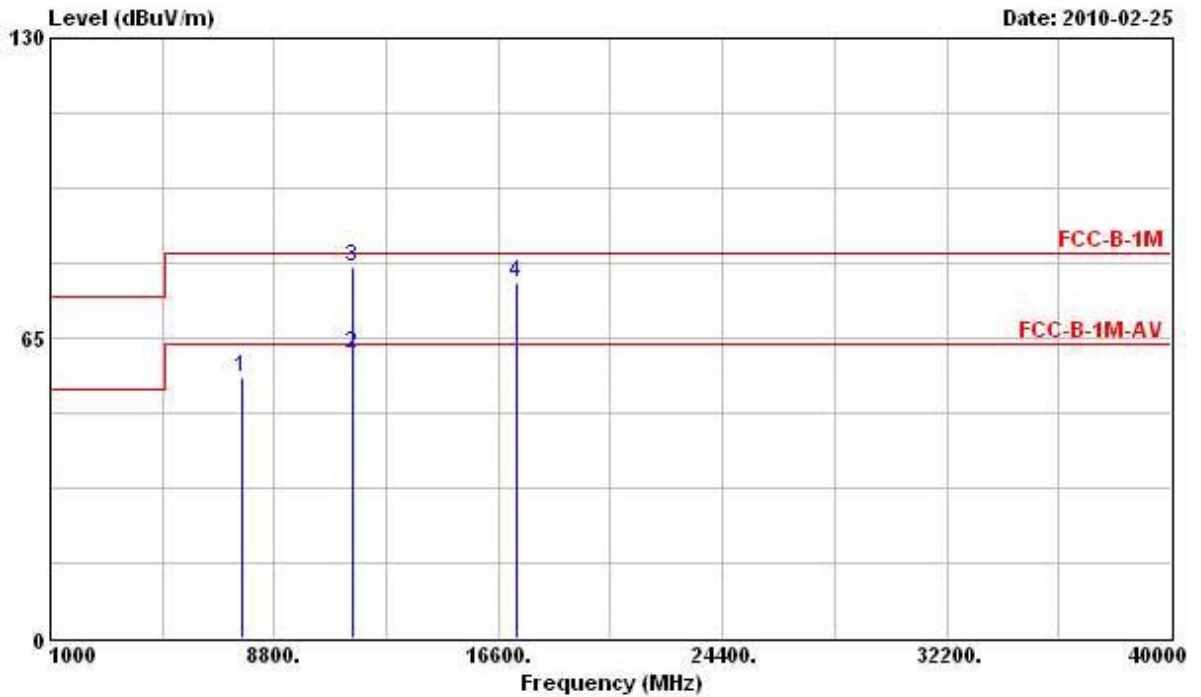
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

3.5.9 Results for Radiated Emissions (1GHz~10<sup>th</sup> Harmonic)

For Two Chain:

Final Test Date	Feb. 25, 2010	Test Site No.	03CH02-HY
Temperature	24	Humidity	58%
Test Engineer	Billy	Configuration	5G 802.11n CH 149 (20MHz)

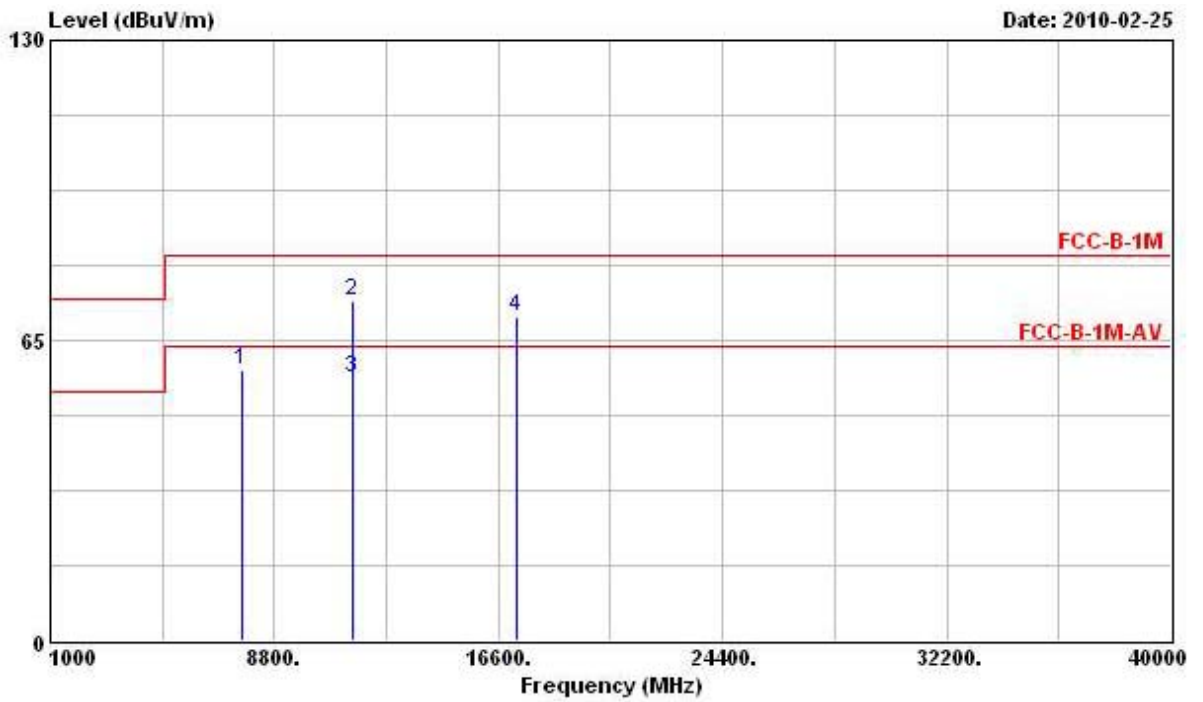
Horizontal



Freq	Level	Over Limit	Limit Line	ReadAntenna	Cable	Preamp	Remark
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB
1 @ 7660.000	56.60	-6.94	63.54	47.21	38.00	5.71	34.32 PK
2 @ 11490.000	61.58	-1.96	63.54	48.00	40.59	6.63	33.64 Average
3 @ 11490.000	80.30	-3.24	83.54	66.72	40.59	6.63	33.64 Peak
4 @ 17235.000	76.91			57.03	43.56	8.55	32.23 Peak

Note: An item 4 is on an un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.6.7).

Vertical

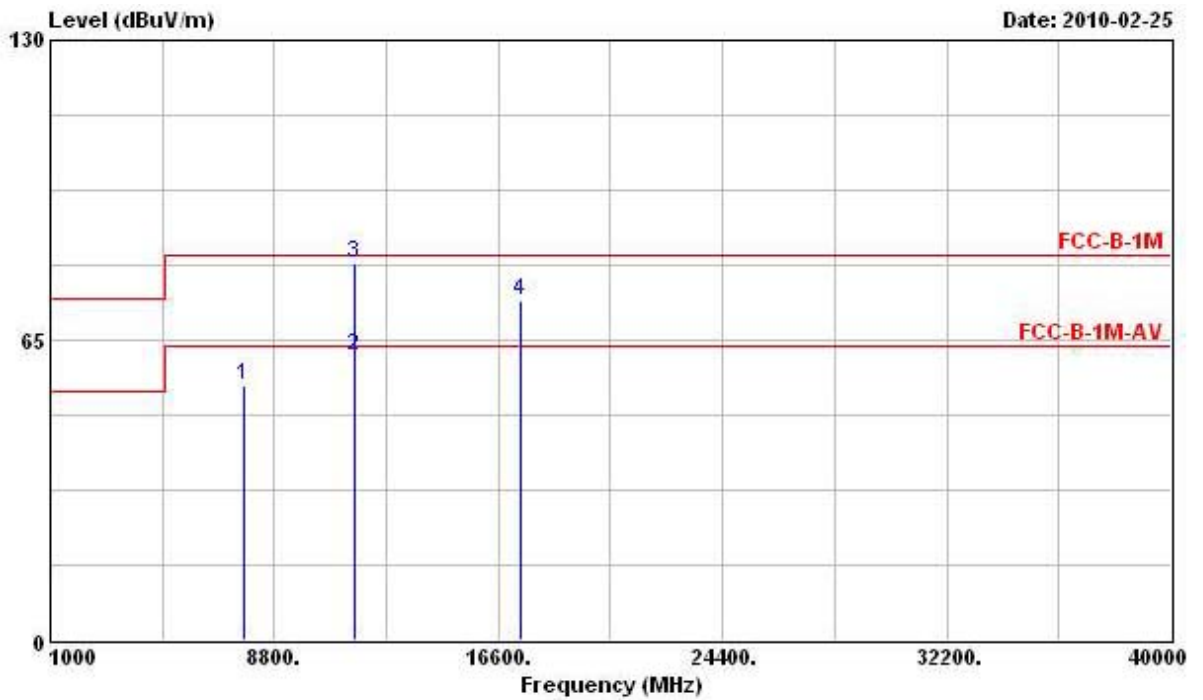


Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @ 7660.000	58.51	-5.03	63.54	49.12	38.00	5.71	34.32	PK
2 @ 11490.000	73.37	-10.17	83.54	59.79	40.59	6.63	33.64	Peak
3 @ 11490.000	56.67	-6.87	63.54	43.09	40.59	6.63	33.64	Average
4 @ 17235.000	69.97			50.09	43.56	8.55	32.23	Peak

Note: An item 4 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.6.7).

<b>Final Test Date</b>	Feb. 25, 2010	<b>Test Site No.</b>	03CH02-HY
<b>Temperature</b>	24	<b>Humidity</b>	58%
<b>Test Engineer</b>	Billy	<b>Configuration</b>	5G 802.11n CH 157 (20MHz)

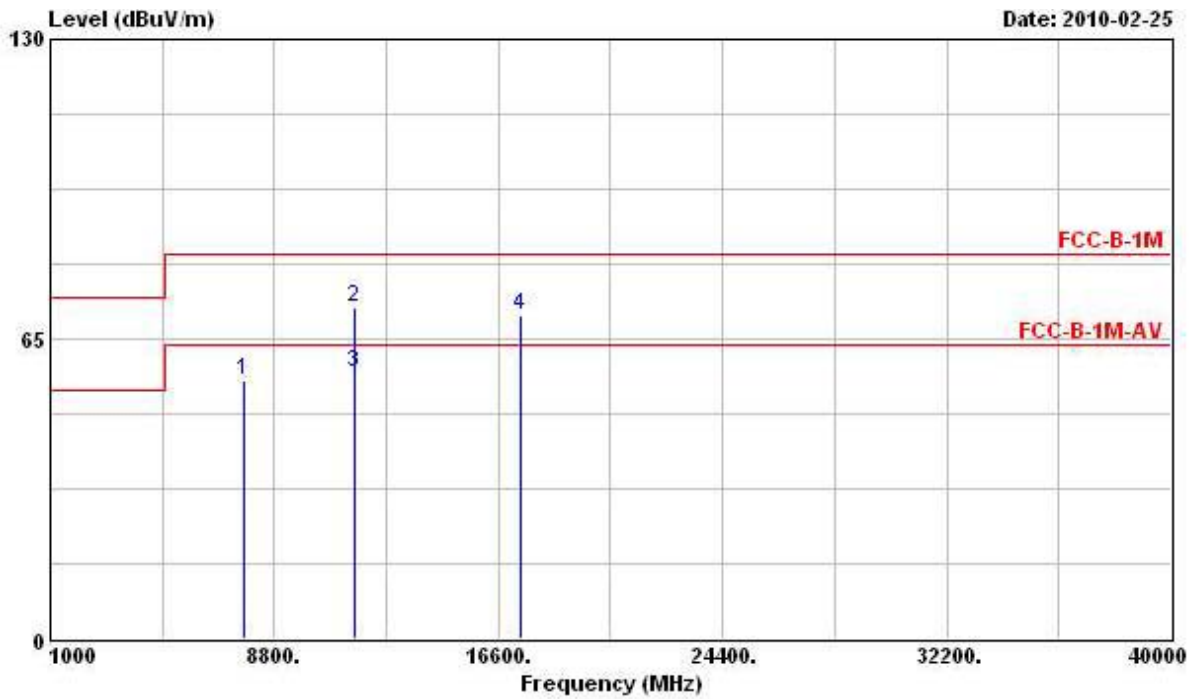
**Horizontal**



Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
MHz	dBUV/m	dB	dBUV/m	dBuV	dB/m	dB	dB	
1 @ 7710.000	55.19	-8.35	63.54	45.76	38.03	5.72	34.32	PK
2 @ 11570.000	61.50	-2.04	63.54	47.87	40.63	6.63	33.63	Average
3 @ 11570.000	81.57	-1.97	83.54	67.94	40.63	6.63	33.63	Peak
4 @ 17355.000	73.62			53.83	43.49	8.50	32.20	Peak

Note: An item 4 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.6.7).

Vertical

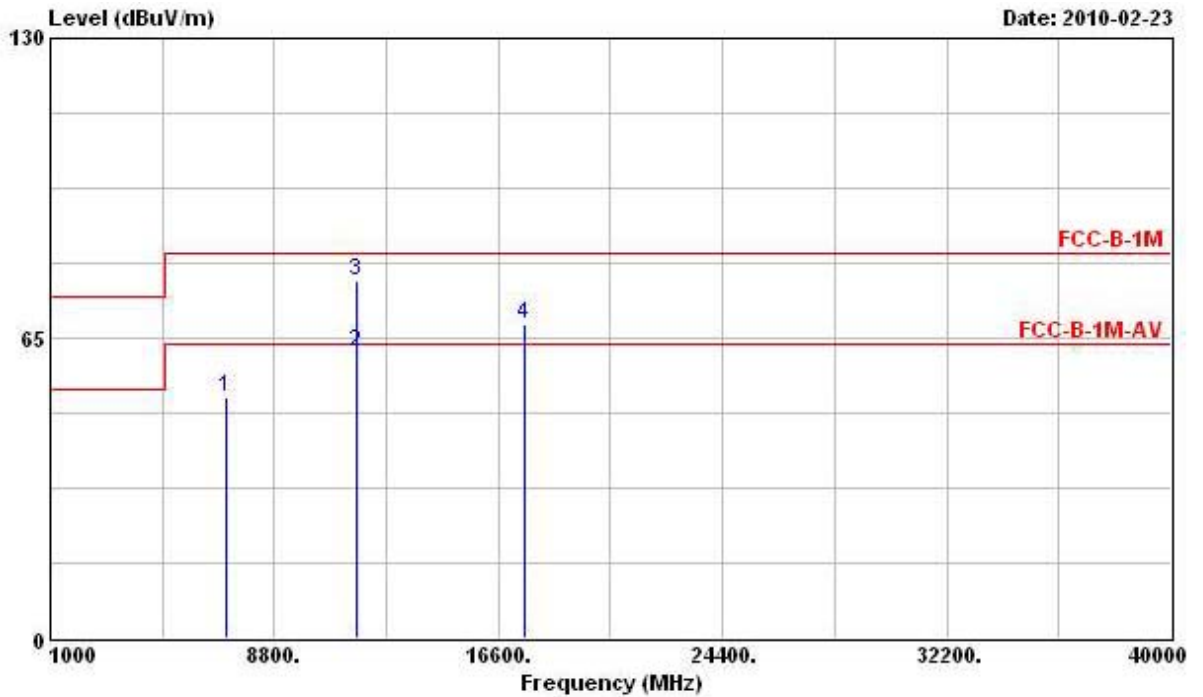


Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @ 7710.000	55.87	-7.67	63.54	46.44	38.03	5.72	34.32	PK
2 @ 11570.000	71.77	-11.77	83.54	58.14	40.63	6.63	33.63	Peak
3 @ 11570.000	57.86	-5.68	63.54	44.23	40.63	6.63	33.63	Average
4 @ 17355.000	70.04			50.25	43.49	8.50	32.20	Peak

Note: An item 4 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.6.7).

<b>Final Test Date</b>	Feb. 23, 2010	<b>Test Site No.</b>	03CH02-HY
<b>Temperature</b>	24	<b>Humidity</b>	58%
<b>Test Engineer</b>	Billy	<b>Configuration</b>	5G 802.11n CH 165 (20MHz)

**Horizontal**

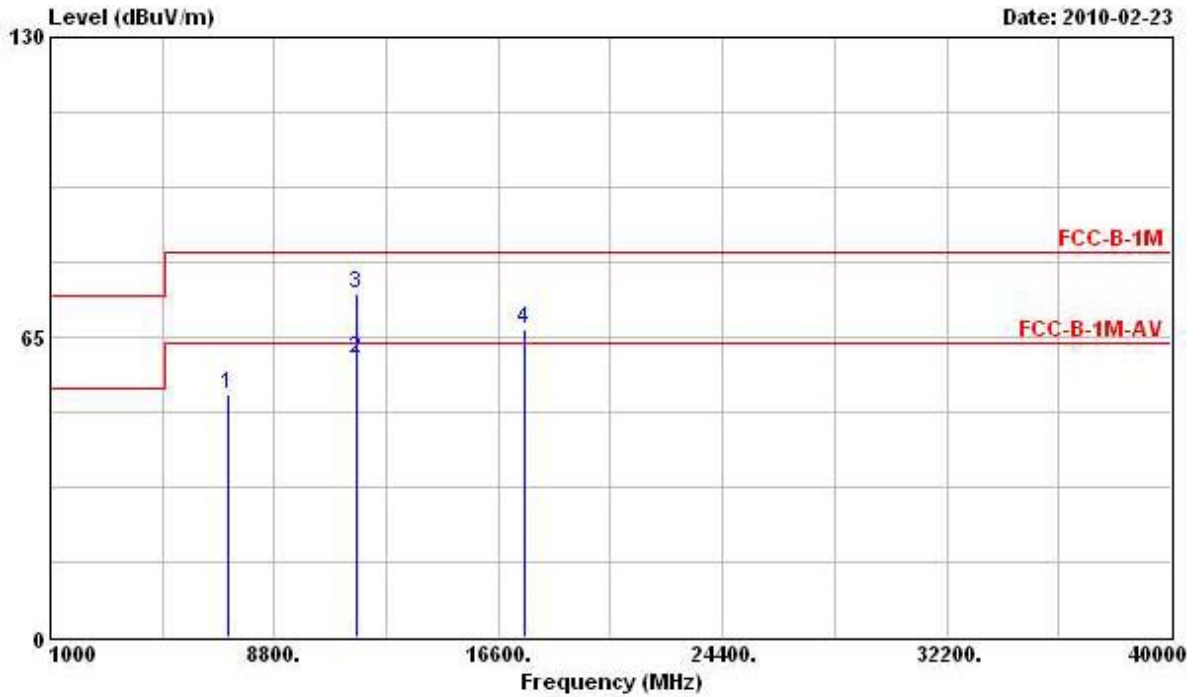


Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @ 7100.000	52.27			43.12	37.82	5.61	34.28	Peak
2 @ 11650.000	61.95	-1.59	63.54	48.25	40.66	6.64	33.60	Average
3 @ 11650.000	77.55	-5.99	83.54	63.85	40.66	6.64	33.60	Peak
4 @ 17475.000	68.06			48.36	43.42	8.44	32.16	Peak

Note: An item 1 and 4 are on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.6.7).



Vertical

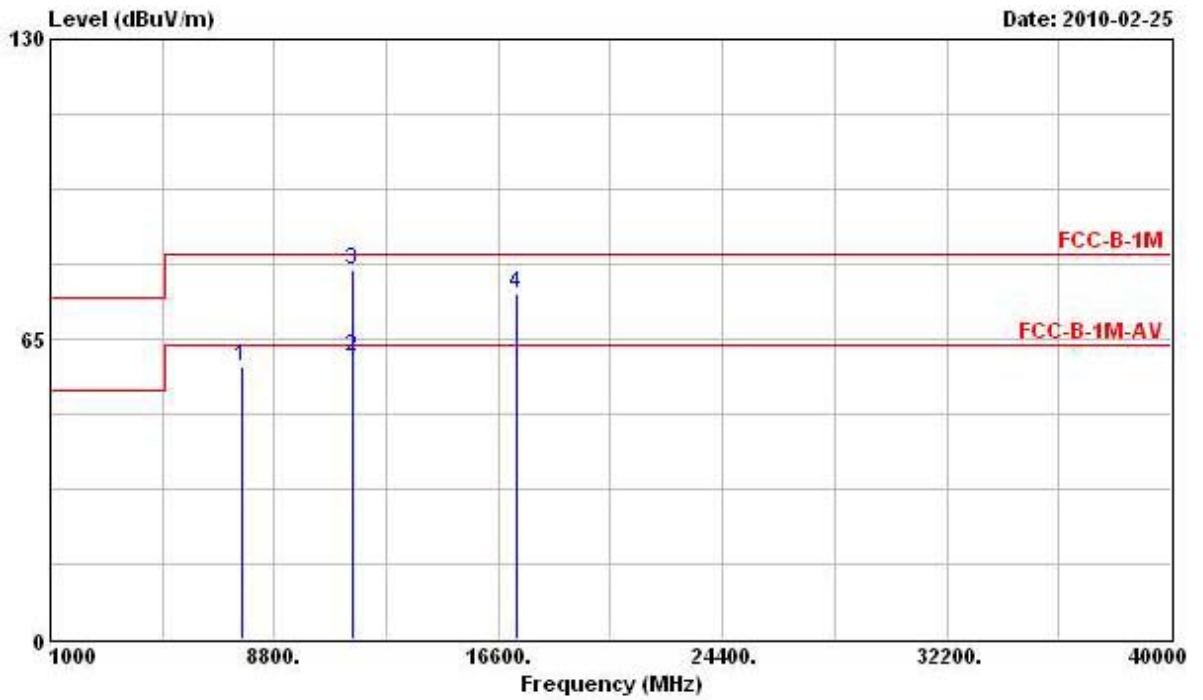


Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @ 7168.000	52.44			43.27	37.83	5.62	34.28	Peak
2 @ 11650.000	60.29	-3.25	63.54	46.59	40.66	6.64	33.60	Average
3 @ 11650.000	74.25	-9.29	83.54	60.55	40.66	6.64	33.60	Peak
4 @ 17475.000	66.85			47.15	43.42	8.44	32.16	Peak

Note: An item 1 and 4 are on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.6.7).

<b>Final Test Date</b>	Feb. 25, 2010	<b>Test Site No.</b>	03CH02-HY
<b>Temperature</b>	24	<b>Humidity</b>	58%
<b>Test Engineer</b>	Billy	<b>Configuration</b>	5G 802.11n CH 151 (40MHz)

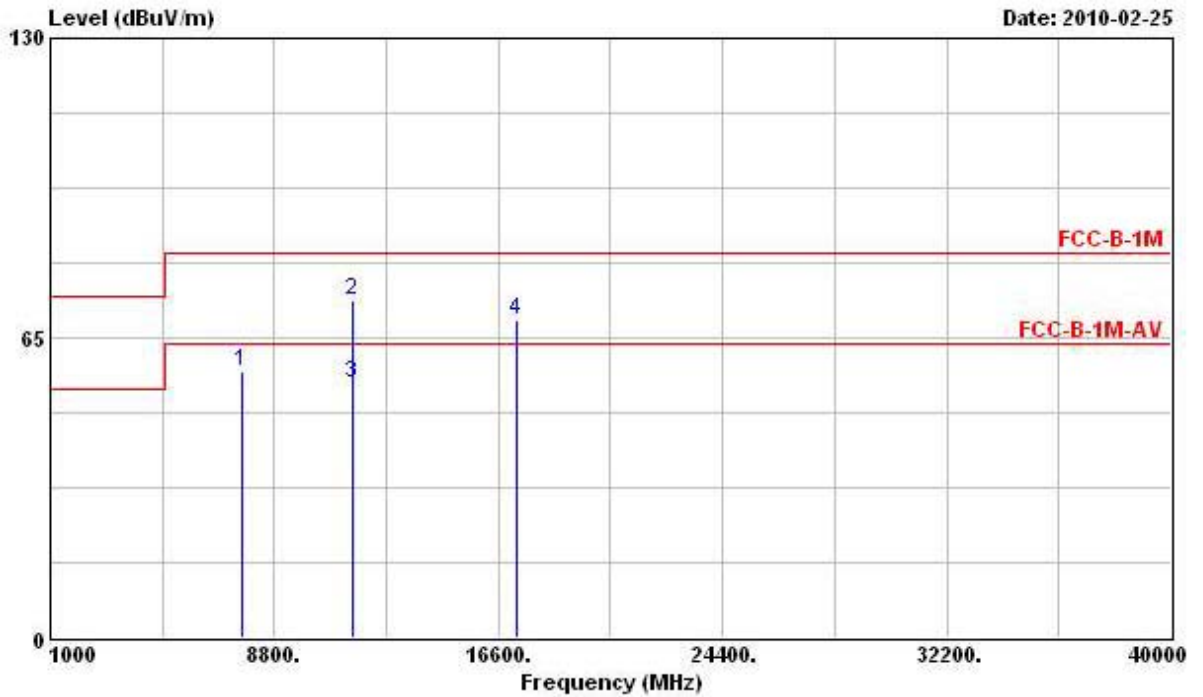
**Horizontal**



Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
MHz	dBUV/m	dB	dBUV/m	dBuV	dB/m	dB	dB	
1 @ 7670.000	59.18	-4.36	63.54	49.79	38.00	5.71	34.32	PK
2 @ 11510.000	60.97	-2.57	63.54	47.40	40.60	6.63	33.66	Average
3 @ 11510.000	80.08	-3.46	83.54	66.51	40.60	6.63	33.66	Peak
4 @ 17265.000	74.67			54.82	43.54	8.54	32.23	Peak

Note: An item 4 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.6.7).

Vertical

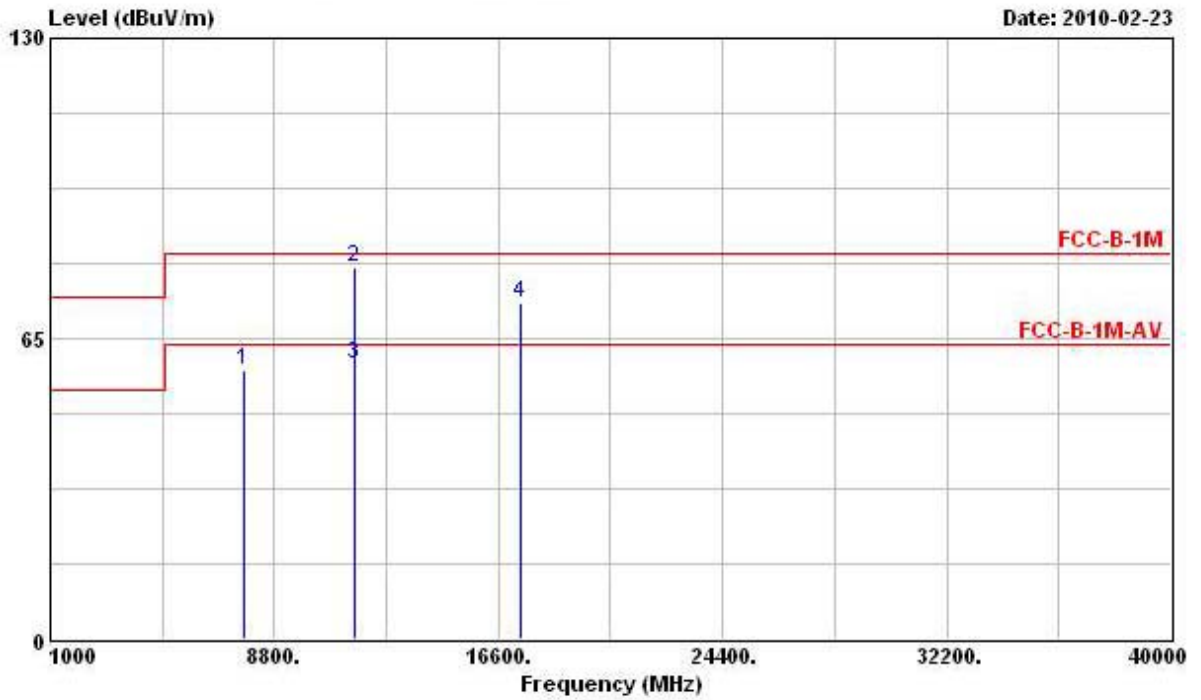


Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @ 7670.000	57.75	-5.79	63.54	48.36	38.00	5.71	34.32	PK
2 @ 11510.000	73.17	-10.37	83.54	59.60	40.60	6.63	33.66	Peak
3 @ 11510.000	55.07	-8.47	63.54	41.50	40.60	6.63	33.66	Average
4 @ 17265.000	68.89			49.04	43.54	8.54	32.23	Peak

Note: An item 4 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.6.7).

<b>Final Test Date</b>	Feb. 23, 2010	<b>Test Site No.</b>	03CH02-HY
<b>Temperature</b>	24	<b>Humidity</b>	58%
<b>Test Engineer</b>	Billy	<b>Configuration</b>	5G 802.11n CH 159 (40MHz)

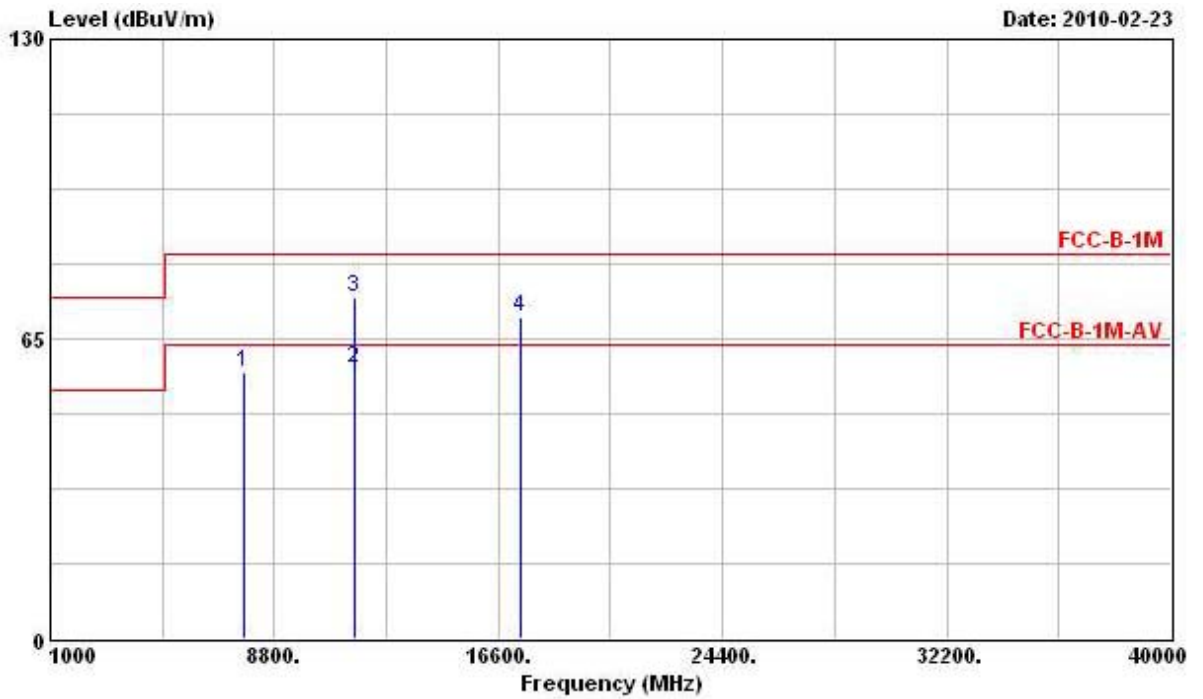
**Horizontal**



Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Factor	Preamp Loss	Preamp Factor	Remark
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @ 7726.000	58.11	-5.43	63.54	48.68	38.04	5.72	34.33	PK
2 @ 11590.000	80.48	-3.06	83.54	66.85	40.63	6.63	33.63	Peak
3 @ 11590.000	59.52	-4.02	63.54	45.89	40.63	6.63	33.63	Average
4 @ 17385.000	72.83			53.06	43.47	8.48	32.18	Peak

Note: An item 4 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.6.7).

Vertical

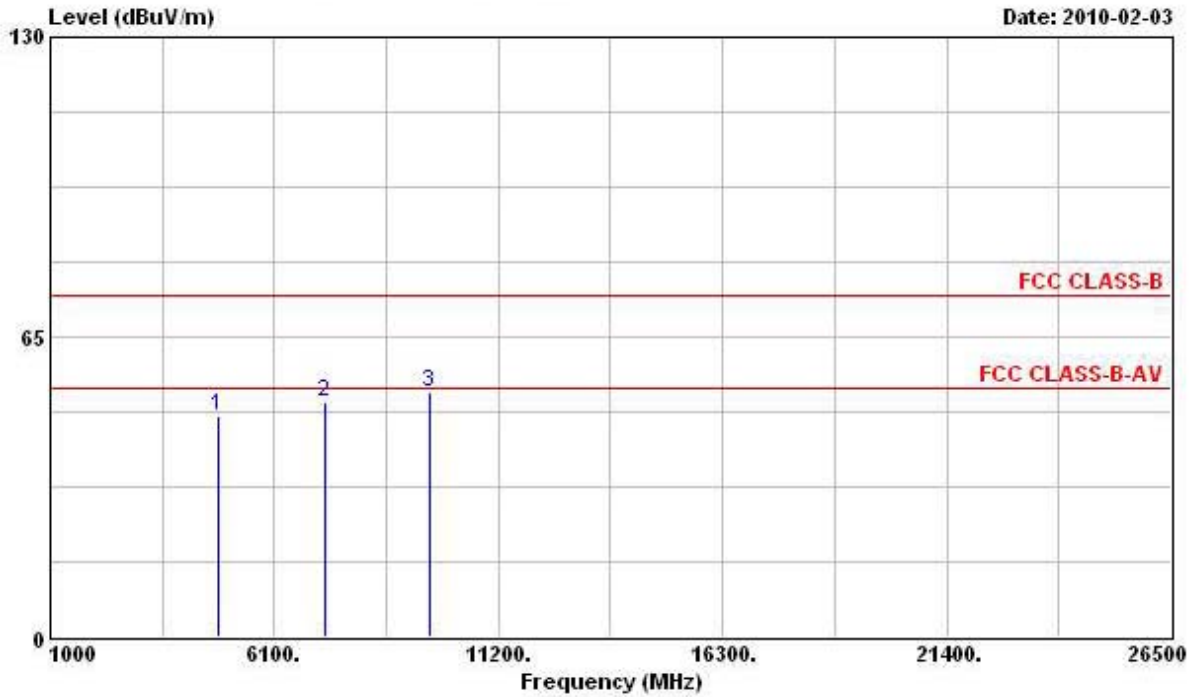


Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @ 7726.640	57.77	-5.77	63.54	48.34	38.04	5.72	34.33	PK
2 @ 11590.000	58.71	-4.83	63.54	45.08	40.63	6.63	33.63	Average
3 @ 11590.000	74.06	-9.48	83.54	60.43	40.63	6.63	33.63	Peak
4 @ 17385.000	69.64			49.87	43.47	8.48	32.18	Peak

Note: An item 4 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.6.7).

<b>Final Test Date</b>	Feb. 03, 2010	<b>Test Site No.</b>	03CH02-HY
<b>Temperature</b>	24	<b>Humidity</b>	58%
<b>Test Engineer</b>	Billy	<b>Configuration</b>	2.4G 802.11n CH 1 (20MHz)

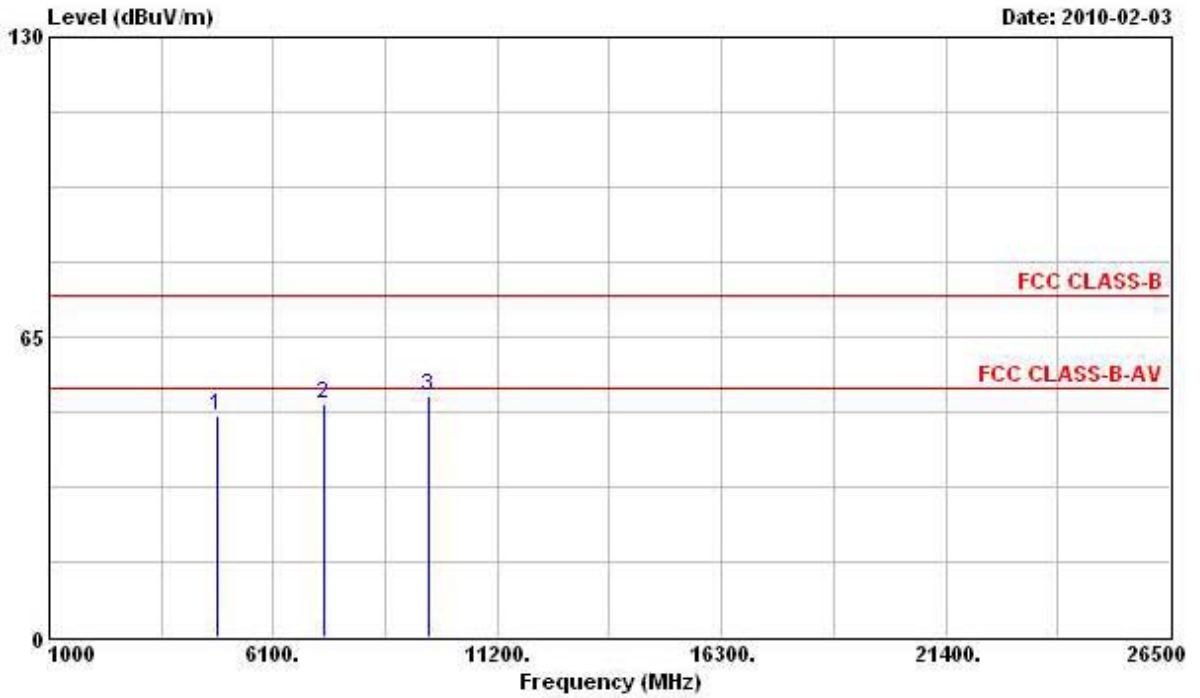
**Horizontal**



Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @ 4824.000	48.02	-5.98	54.00	42.19	35.76	4.58	34.51	PK
2 @ 7236.000	50.86			41.67	37.85	5.63	34.29	Peak
3 @ 9648.000	53.23			42.13	39.39	6.34	34.63	Peak

Note: An item 2 and 3 are on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.6.7).

Vertical

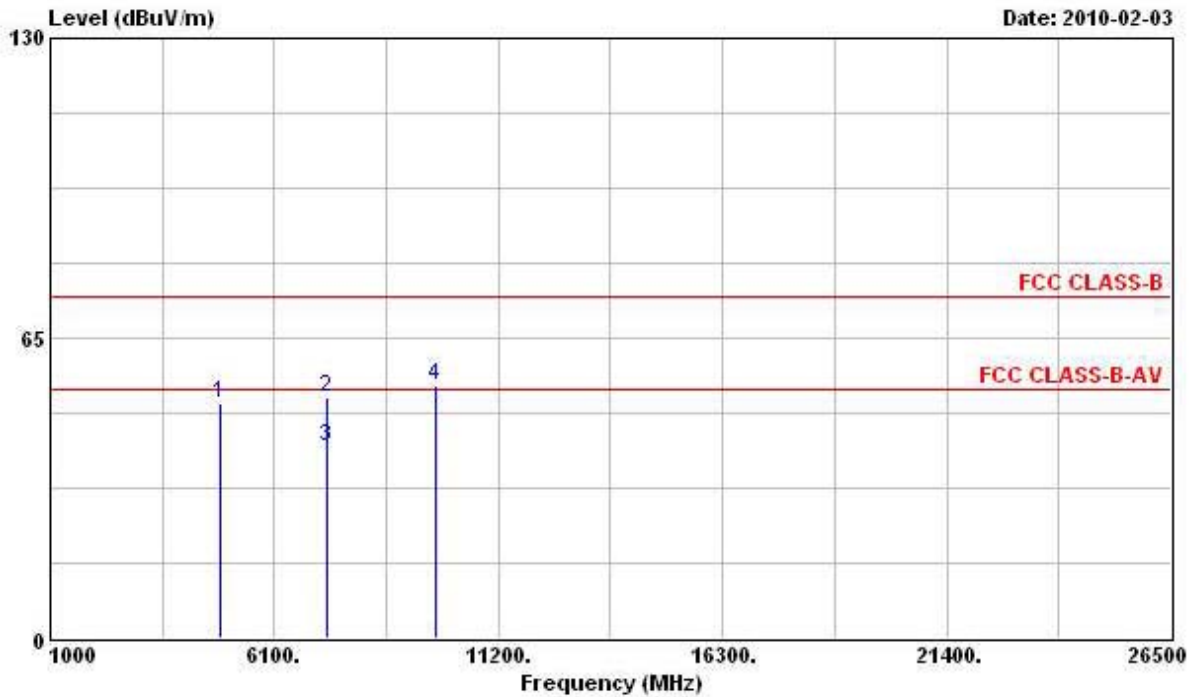


Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @ 4824.000	47.71	-6.29	54.00	42.51	35.13	4.58	34.51	PK
2 @ 7236.000	50.63			42.39	36.90	5.63	34.29	Peak
3 @ 9648.000	52.32			42.02	38.59	6.34	34.63	Peak

Note: An item 2 and 3 are on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.6.7).

<b>Final Test Date</b>	Feb. 03, 2010	<b>Test Site No.</b>	03CH02-HY
<b>Temperature</b>	24	<b>Humidity</b>	58%
<b>Test Engineer</b>	Billy	<b>Configuration</b>	2.4G 802.11n CH 6 (20MHz)

**Horizontal**

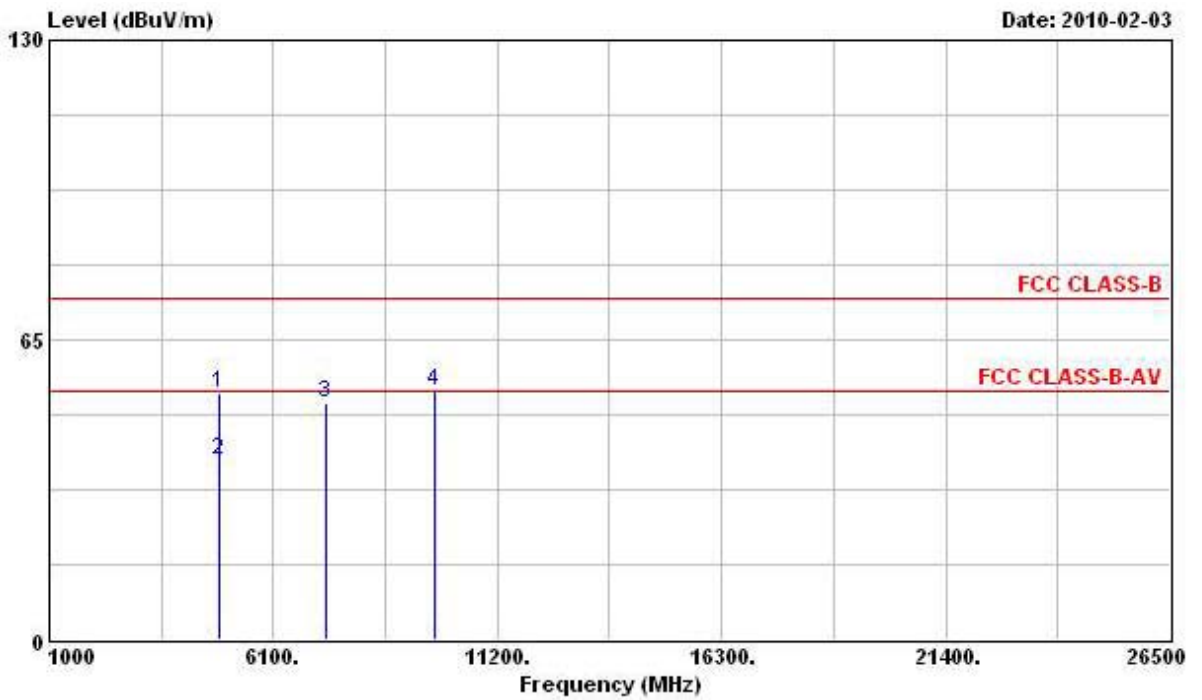


Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @ 4874.000	50.77	-3.23	54.00	44.78	35.83	4.61	34.45	Average
2 @ 7311.000	52.36	-21.64	74.00	43.15	37.86	5.64	34.29	Peak
3 @ 7311.000	41.66	-12.34	54.00	32.45	37.86	5.64	34.29	Average
4 @ 9748.000	54.75			43.46	39.51	6.36	34.58	Peak

Note: An item 4 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.6.7).



Vertical

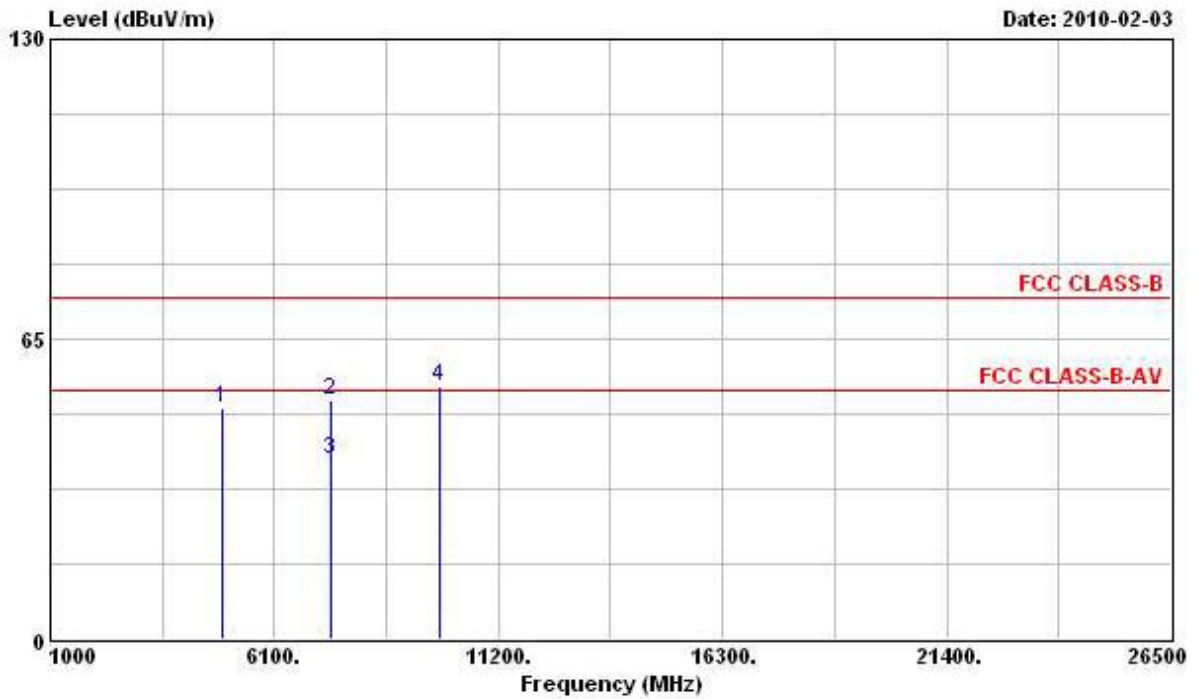


	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @	4874.000	53.38	-20.62	74.00	48.04	35.18	4.61	34.45	Peak
2 @	4874.000	38.84	-15.16	54.00	33.50	35.18	4.61	34.45	Average
3 @	7311.000	51.17	-22.83	74.00	42.90	36.92	5.64	34.29	Peak
4 @	9748.000	54.03			43.54	38.71	6.36	34.58	Peak

Note: An item 4 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.6.7).

<b>Final Test Date</b>	Feb. 03, 2010	<b>Test Site No.</b>	03CH02-HY
<b>Temperature</b>	24	<b>Humidity</b>	58%
<b>Test Engineer</b>	Billy	<b>Configuration</b>	2.4G 802.11n CH 11 (20MHz)

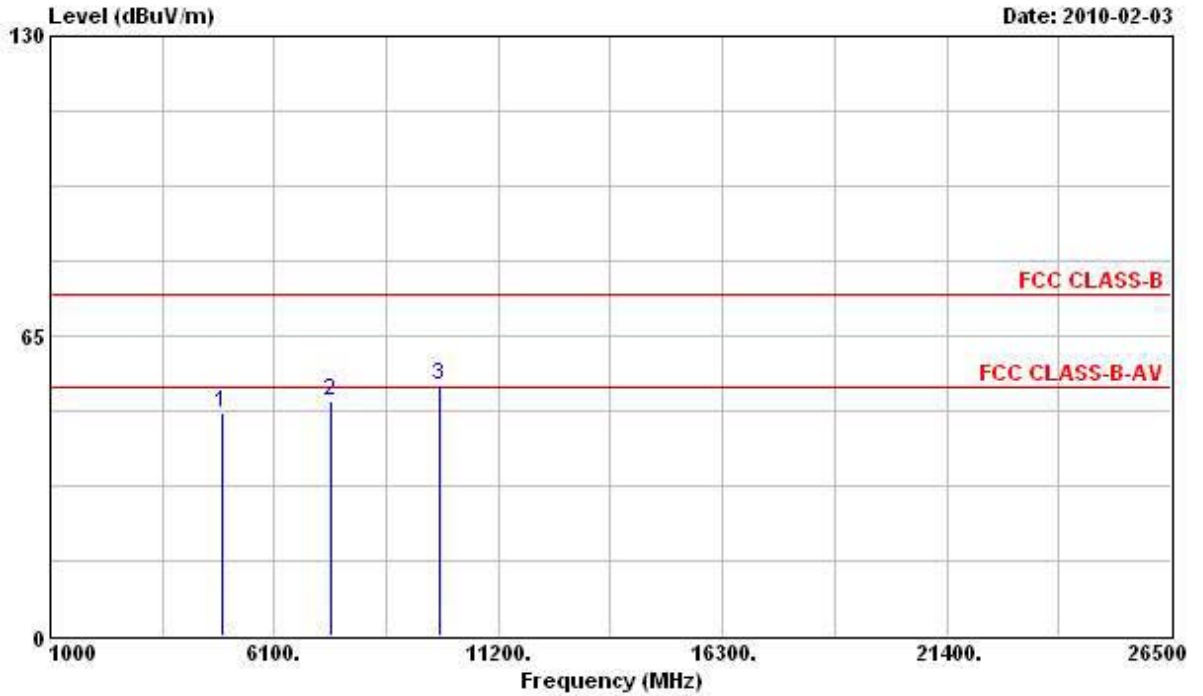
**Horizontal**



	<b>Freq</b>	<b>Level</b>	<b>Over Limit</b>	<b>Limit Line</b>	<b>ReadAntenna Level</b>	<b>Antenna Factor</b>	<b>Cable Loss</b>	<b>Preamp Factor</b>	<b>Remark</b>
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @	4924.000	50.01	-3.99	54.00	43.81	35.90	4.68	34.38	Average
2 @	7386.000	51.80	-22.20	74.00	42.56	37.88	5.65	34.29	Peak
3 @	7386.000	38.76	-15.24	54.00	29.52	37.88	5.65	34.29	Average
4 @	9848.000	54.84			43.39	39.61	6.38	34.54	Peak

Note: An item 4 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.6.7).

Vertical

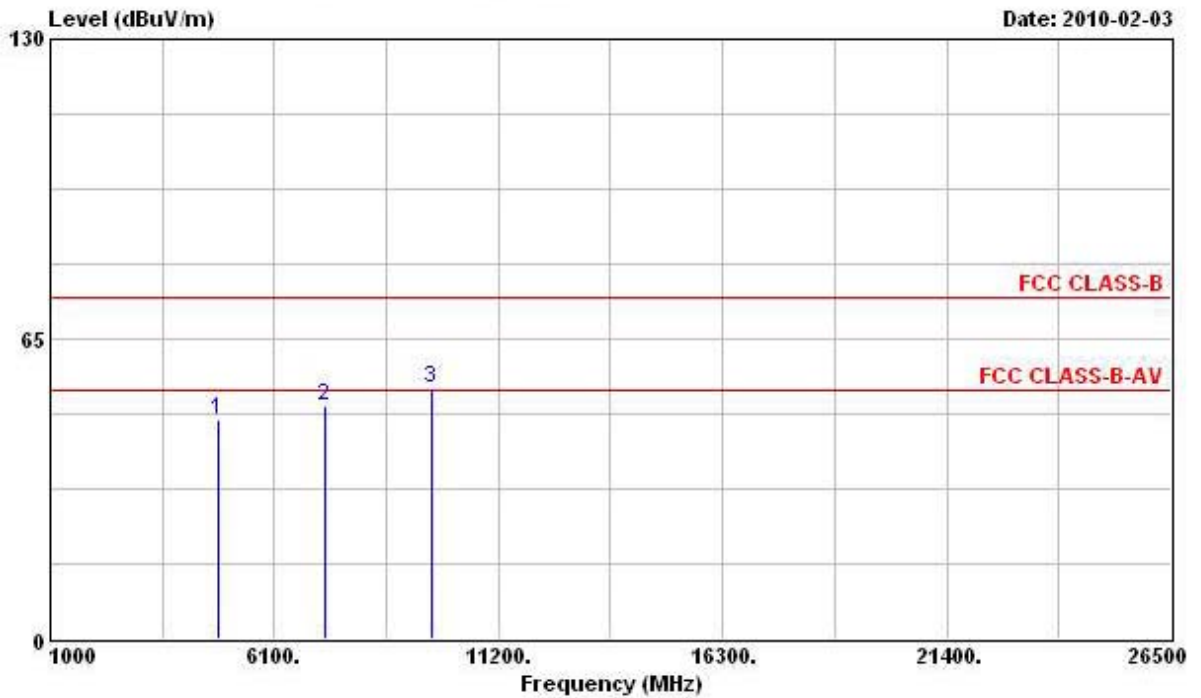


Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @ 4924.000	48.23	-5.77	54.00	42.70	35.23	4.68	34.38	PK
2 @ 7386.000	50.87	-3.13	54.00	42.55	36.96	5.65	34.29	PK
3 @ 9848.000	54.47			43.82	38.81	6.38	34.54	Peak

Note: An item 3 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.6.7).

<b>Final Test Date</b>	Feb. 03, 2010	<b>Test Site No.</b>	03CH02-HY
<b>Temperature</b>	24	<b>Humidity</b>	58%
<b>Test Engineer</b>	Billy	<b>Configuration</b>	2.4G 802.11n CH 3 (40MHz)

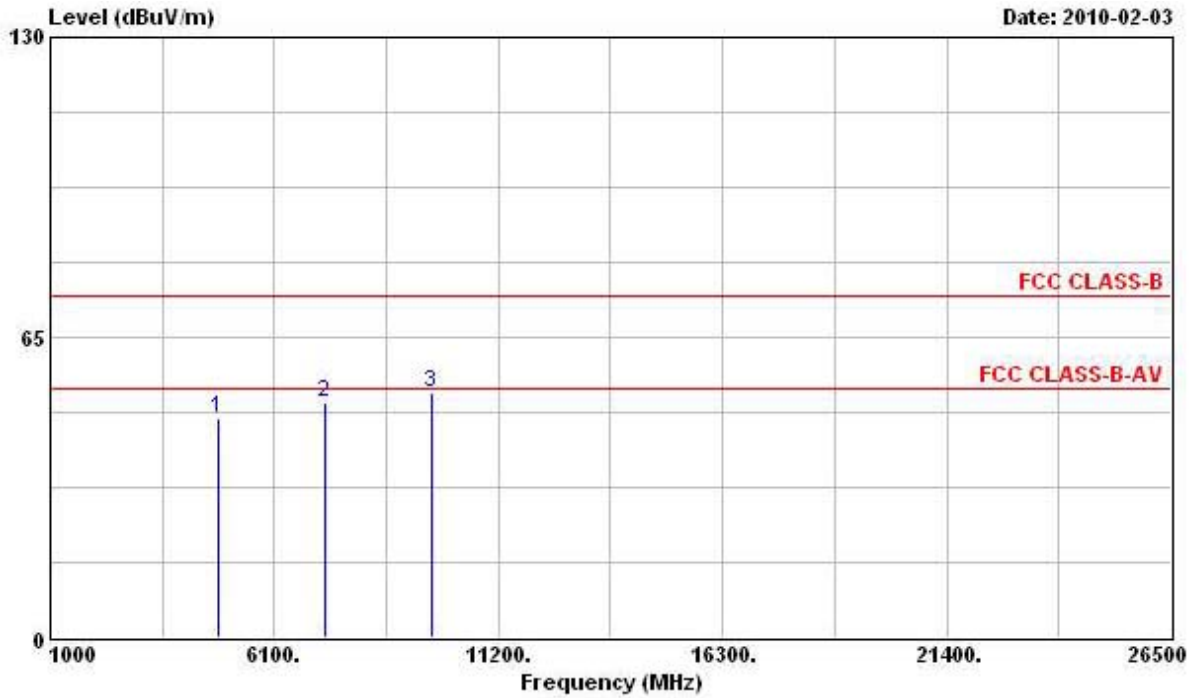
**Horizontal**



Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @ 4844.000	47.64	-6.36	54.00	41.73	35.78	4.61	34.48	PK
2 @ 7266.000	50.37	-3.63	54.00	41.17	37.86	5.63	34.29	PK
3 @ 9688.000	54.37			43.19	39.43	6.35	34.60	Peak

Note: An item 3 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.6.7).

Vertical

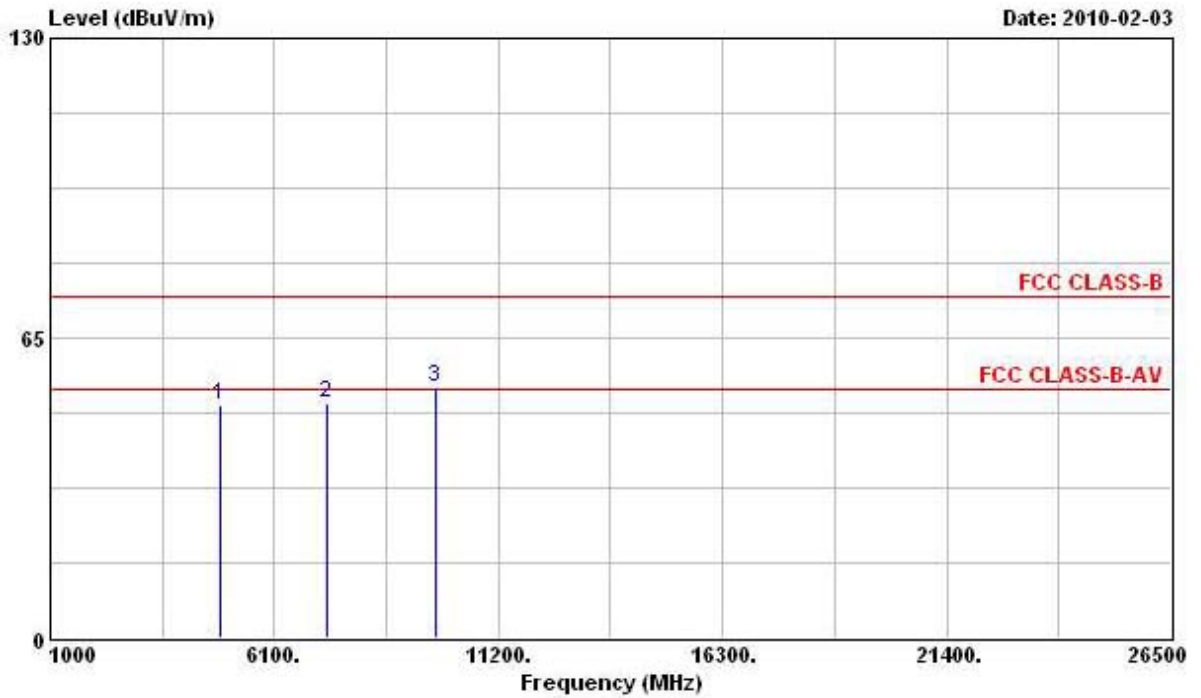


Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @ 4844.000	47.27	-6.73	54.00	42.00	35.14	4.61	34.48	PK
2 @ 7266.000	50.70	-3.30	54.00	42.45	36.91	5.63	34.29	PK
3 @ 9688.000	53.19			42.81	38.63	6.35	34.60	Peak

Note: An item 3 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.6.7).

<b>Final Test Date</b>	Feb. 03, 2010	<b>Test Site No.</b>	03CH02-HY
<b>Temperature</b>	24	<b>Humidity</b>	58%
<b>Test Engineer</b>	Billy	<b>Configuration</b>	2.4G 802.11n CH 6 (40MHz)

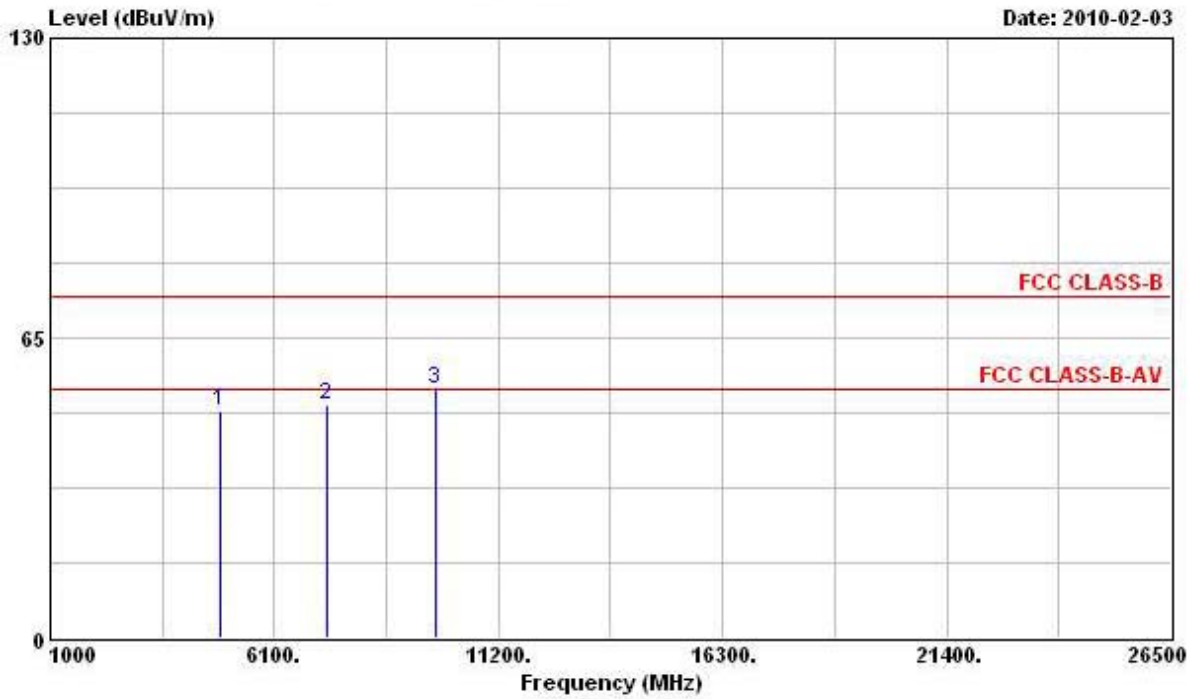
**Horizontal**



Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @ 4874.000	50.59	-3.41	54.00	44.60	35.83	4.61	34.45	PK
2 @ 7311.000	50.70	-3.30	54.00	41.49	37.86	5.64	34.29	PK
3 @ 9748.000	54.42			43.13	39.51	6.36	34.58	Peak

Note: An item 3 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.6.7).

**Vertical**

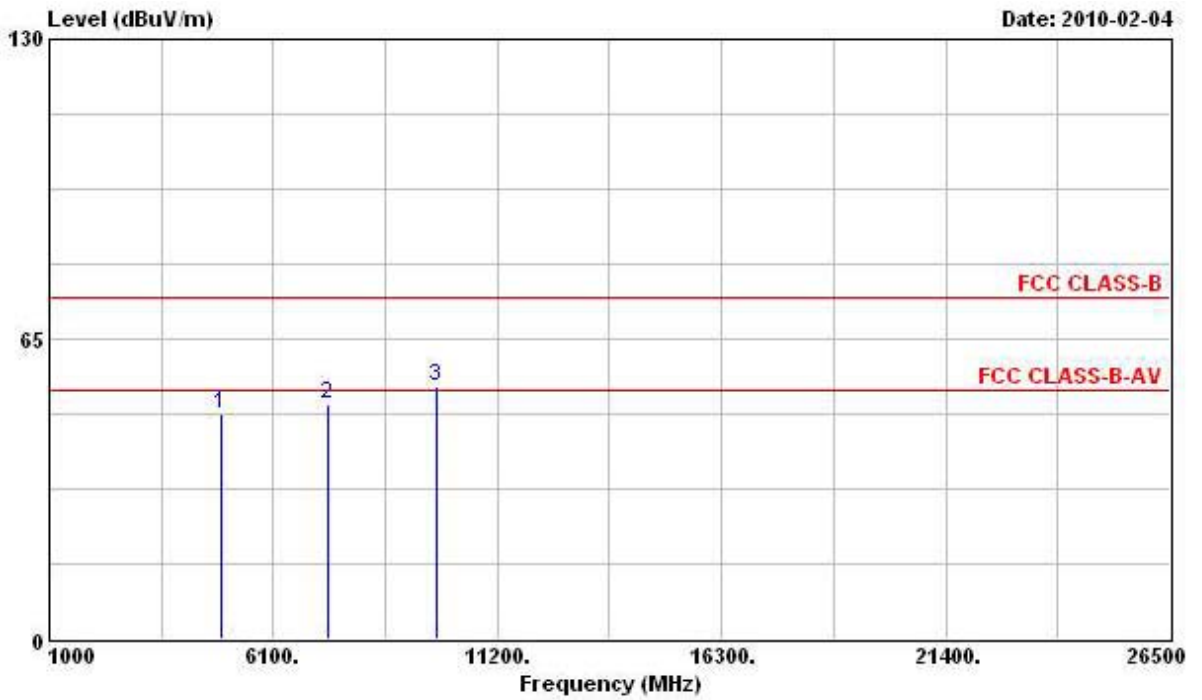


Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @ 4874.000	49.07	-4.93	54.00	43.73	35.18	4.61	34.45	PK
2 @ 7311.000	50.30	-3.70	54.00	42.03	36.92	5.64	34.29	PK
3 @ 9748.000	54.08			43.59	38.71	6.36	34.58	Peak

Note: An item 3 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.6.7).

<b>Final Test Date</b>	Feb. 04, 2010	<b>Test Site No.</b>	03CH02-HY
<b>Temperature</b>	24	<b>Humidity</b>	58%
<b>Test Engineer</b>	Billy	<b>Configuration</b>	2.4G 802.11n CH 9 (40MHz)

**Horizontal**

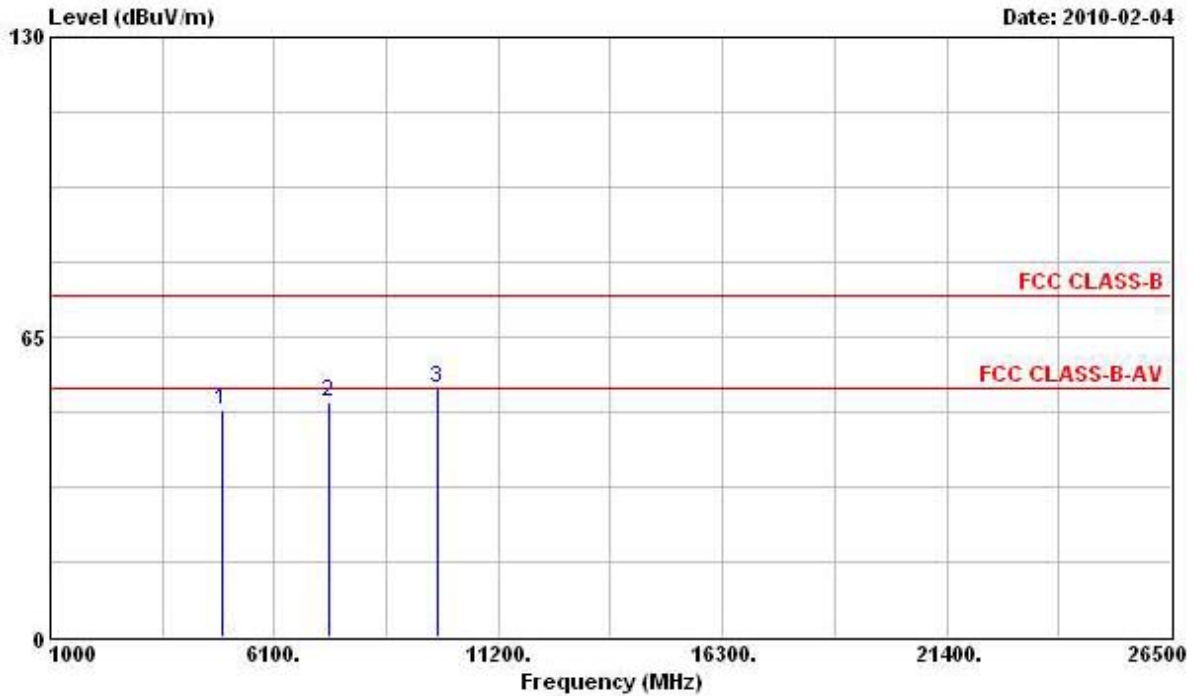


Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @ 4904.000	48.54	-5.46	54.00	42.44	35.88	4.64	34.42	PK
2 @ 7356.000	50.83	-3.17	54.00	41.61	37.87	5.64	34.29	PK
3 @ 9808.000	54.92			43.54	39.57	6.37	34.56	Peak

Note: An item 3 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.6.7).



**Vertical**



Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @ 4904.000	49.03	-4.97	54.00	43.60	35.21	4.64	34.42	PK
2 @ 7356.000	50.70	-3.30	54.00	42.41	36.94	5.64	34.29	PK
3 @ 9808.000	53.83			43.25	38.77	6.37	34.56	Peak

Note: An item 3 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.6.7).

Note:

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

**3.6 Band Edge and Fundamental Emissions Measurement**

**3.6.1 Limit**

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

<b>Frequencies (MHz)</b>	<b>Field Strength (micorvolts/meter)</b>	<b>Measurement Distance (meters)</b>
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

**3.6.2 Measuring Instruments and Setting**

Please refer to section 4 of equipments list in this report. The following table is the setting of the spectrum analyzer.

<b>Spectrum Parameter</b>	<b>Setting</b>
Attenuation	Auto
Span Frequency	100 MHz
RB / VB (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average
RB / VB (Emission in non-restricted band)	1MHz / 1MHz for Peak

**3.6.3 Test Procedures**

1. The test procedure is the same as section 3.5.3; only the frequency range investigated is limited to 100MHz around band edges.
2. In case the emission is fail due to the used RB/VB is too wide, marker-delta method of FCC Public Notice DA00-705 will be followed.

**3.6.4 Test Setup Layout**

This test setup layout is the same as that shown in section 3.5.4.

**3.6.5 Test Deviation**

There is no deviation with the original standard.

**3.6.6 EUT Operation during Test**

The EUT was programmed to be in continuously transmitting mode.

**3.6.7 Test Result of Band Edge and Fundamental Emissions**

**For Two Chain:**

<b>Final Test Date</b>	Feb. 05, 2010	<b>Test Site No.</b>	03CH02-HY
<b>Temperature</b>	24	<b>Humidity</b>	58%
<b>Test Engineer</b>	Billy	<b>Configuration</b>	2.4G 802.11n Ant. A + Ant. B CH 1, 6, 11 (20MHz)

**Channel 1**

	<b>Freq</b>	<b>Level</b>	<b>Over Limit</b>	<b>Limit Line</b>	<b>ReadAntenna Level</b>	<b>Antenna Factor</b>	<b>Cable Loss</b>	<b>Preamp Factor</b>	<b>Remark</b>
	<b>MHz</b>	<b>dBuV/m</b>	<b>dB</b>	<b>dBuV/m</b>	<b>dBuV</b>	<b>dB/m</b>	<b>dB</b>	<b>dB</b>	
1 @	2390.000	66.63	-7.37	74.00	31.82	31.79	3.02	0.00	Peak
2 @	2419.060	115.88			81.00	31.86	3.02	0.00	Peak
1 @	2390.000	52.56	-1.44	54.00	17.75	31.79	3.02	0.00	Average
2 @	2418.490	104.98			70.10	31.86	3.02	0.00	Average

An item 2 is Fundamental Emissions.

**Channel 6**

	<b>Freq</b>	<b>Level</b>	<b>Over Limit</b>	<b>Limit Line</b>	<b>ReadAntenna Level</b>	<b>Antenna Factor</b>	<b>Cable Loss</b>	<b>Preamp Factor</b>	<b>Remark</b>
	<b>MHz</b>	<b>dBuV/m</b>	<b>dB</b>	<b>dBuV/m</b>	<b>dBuV</b>	<b>dB/m</b>	<b>dB</b>	<b>dB</b>	
1 @	2439.580	123.79			88.75	31.99	3.05	0.00	Peak
1 @	2438.250	111.69			76.65	31.99	3.05	0.00	Average

An item 1 is Fundamental Emissions.

**Channel 11**

	<b>Freq</b>	<b>Level</b>	<b>Over Limit</b>	<b>Limit Line</b>	<b>ReadAntenna Level</b>	<b>Antenna Factor</b>	<b>Cable Loss</b>	<b>Preamp Factor</b>	<b>Remark</b>
	<b>MHz</b>	<b>dBuV/m</b>	<b>dB</b>	<b>dBuV/m</b>	<b>dBuV</b>	<b>dB/m</b>	<b>dB</b>	<b>dB</b>	
1 @	2454.780	113.56			78.45	32.06	3.05	0.00	Peak
2 @	2483.500	66.84	-7.16	74.00	31.63	32.13	3.08	0.00	Peak
1 @	2456.490	102.72			67.61	32.06	3.05	0.00	Average
2 @	2483.500	53.00	-1.00	54.00	17.79	32.13	3.08	0.00	Average

An item 1 is Fundamental Emissions.

<b>Final Test Date</b>	Mar. 05, 2010	<b>Test Site No.</b>	03CH02-HY
<b>Temperature</b>	24	<b>Humidity</b>	58%
<b>Test Engineer</b>	Billy	<b>Configuration</b>	2.4G 802.11n Ant. A + Ant. B CH 3, 6, 9 (40MHz)

**Channel 3**

	<b>Freq</b>	<b>Level</b>	<b>Over Limit</b>	<b>Limit Line</b>	<b>ReadAntenna Level</b>	<b>Antenna Factor</b>	<b>Cable Loss</b>	<b>Preamp Factor</b>	<b>Remark</b>
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @	2390.000	67.29	-6.71	74.00	32.48	31.79	3.02	0.00	Peak
2 @	2439.010	106.09			71.05	31.99	3.05	0.00	Peak
1 @	2381.820	53.00	-1.00	54.00	18.29	31.72	2.99	0.00	Average
2 @	2418.490	93.16			58.28	31.86	3.02	0.00	Peak

An item 2 is Fundamental Emissions.

**Channel 6**

	<b>Freq</b>	<b>Level</b>	<b>Over Limit</b>	<b>Limit Line</b>	<b>ReadAntenna Level</b>	<b>Antenna Factor</b>	<b>Cable Loss</b>	<b>Preamp Factor</b>	<b>Remark</b>
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @	2443.570	120.83			85.79	31.99	3.05	0.00	Peak
1 @	2441.860	107.70			72.66	31.99	3.05	0.00	Average

An item 1 is Fundamental Emissions.

**Channel 9**

	<b>Freq</b>	<b>Level</b>	<b>Over Limit</b>	<b>Limit Line</b>	<b>ReadAntenna Level</b>	<b>Antenna Factor</b>	<b>Cable Loss</b>	<b>Preamp Factor</b>	<b>Remark</b>
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @	2446.420	104.66			69.40	32.21	3.05	0.00	Peak
2 @	2483.500	69.77	-4.23	74.00	34.35	32.34	3.08	0.00	Peak
1 @	2467.890	91.17			55.81	32.28	3.08	0.00	Average
2 @	2483.500	52.90	-1.10	54.00	17.48	32.34	3.08	0.00	Average

An item 1 is Fundamental Emissions.

Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m).

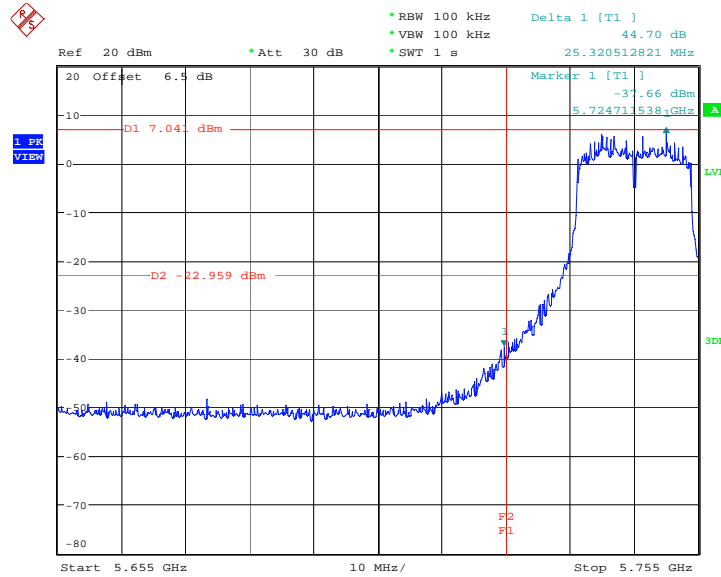
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

**For Emission not in Restricted Band**

<b>Final Test Date</b>	Mar. 02, 2010	<b>Test Site No.</b>	TH01-HY
<b>Temperature</b>	24	<b>Humidity</b>	55%
<b>Test Engineer</b>	Duncan	<b>Configuration</b>	802.11n

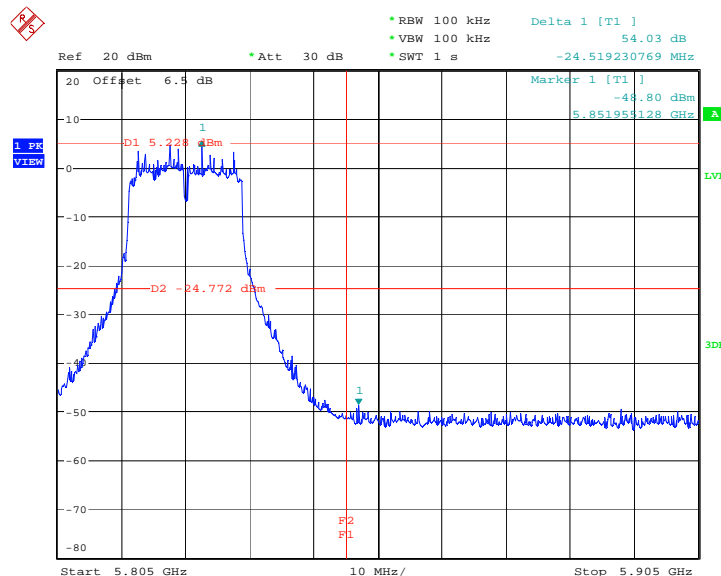
**For Two Chain:**

**Low Band Edge Plot on Configuration of IEEE 802.11n-5G Ant. A + Ant. B (20MHz) / 5745 MHz**



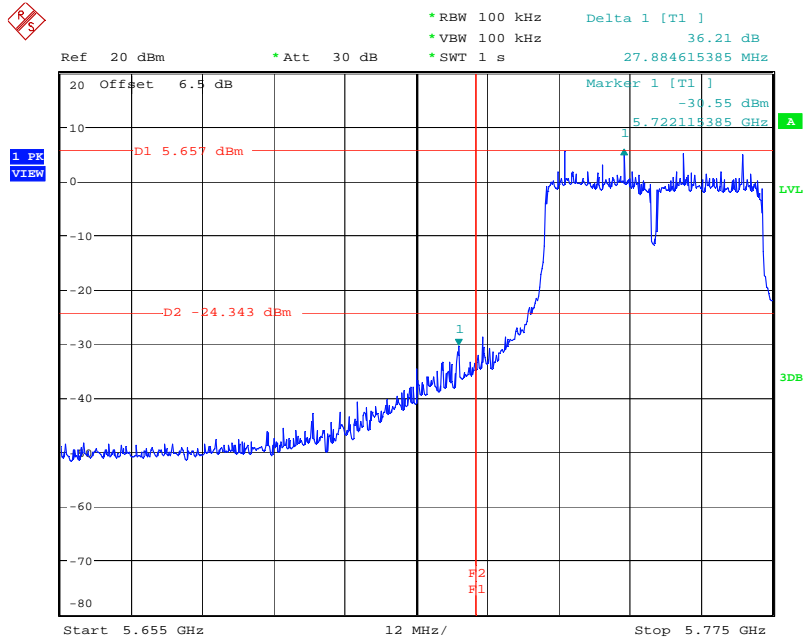
Date: 2.MAR.2010 14:17:13

**High Band Edge Plot on Configuration of IEEE 802.11n-5G Ant. A + Ant. B (20MHz) / 5825 MHz**



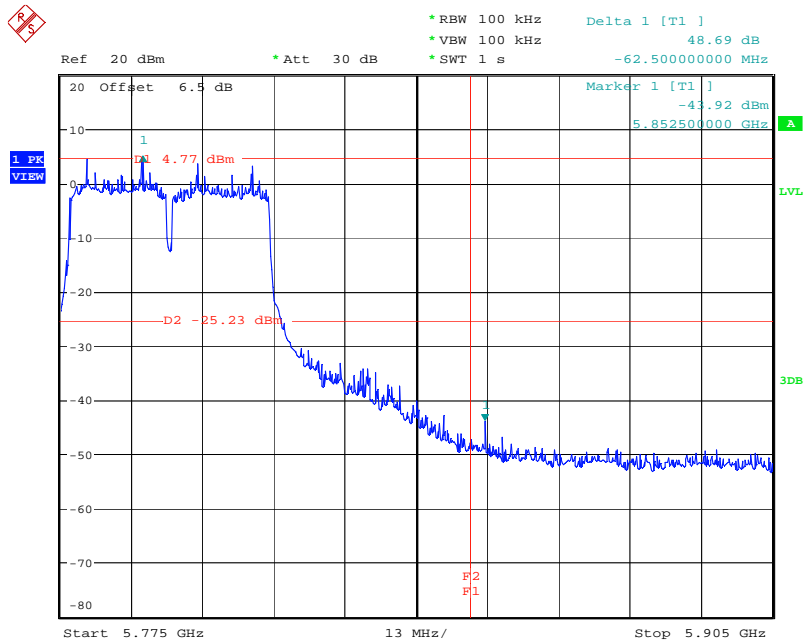
Date: 2.MAR.2010 14:27:25

Low Band Edge Plot on Configuration of IEEE 802.11n-5G Ant. A + Ant. B (40MHz) / 5755 MHz



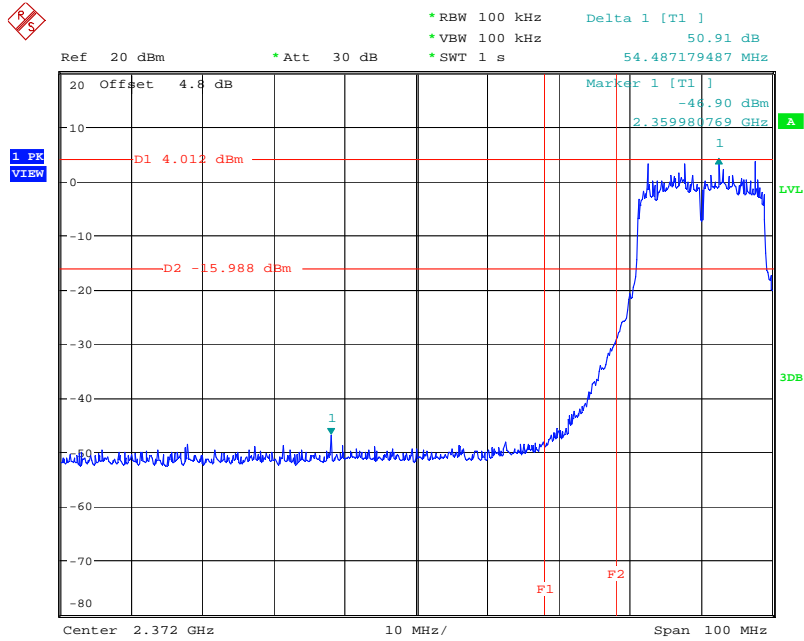
Date: 2.MAR.2010 14:19:02

High Band Edge Plot on Configuration of IEEE 802.11n-5G Ant. A + Ant. B (40MHz) / 5795 MHz



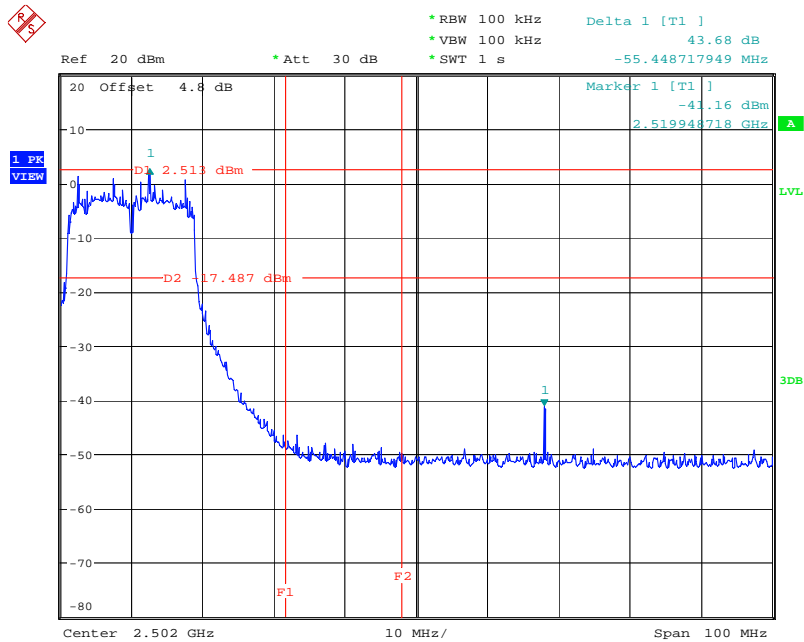
Date: 2.MAR.2010 14:22:19

Low Band Edge Plot on Configuration of IEEE 802.11n-2.4G Ant. A + Ant. B (20MHz) / 2412 MHz



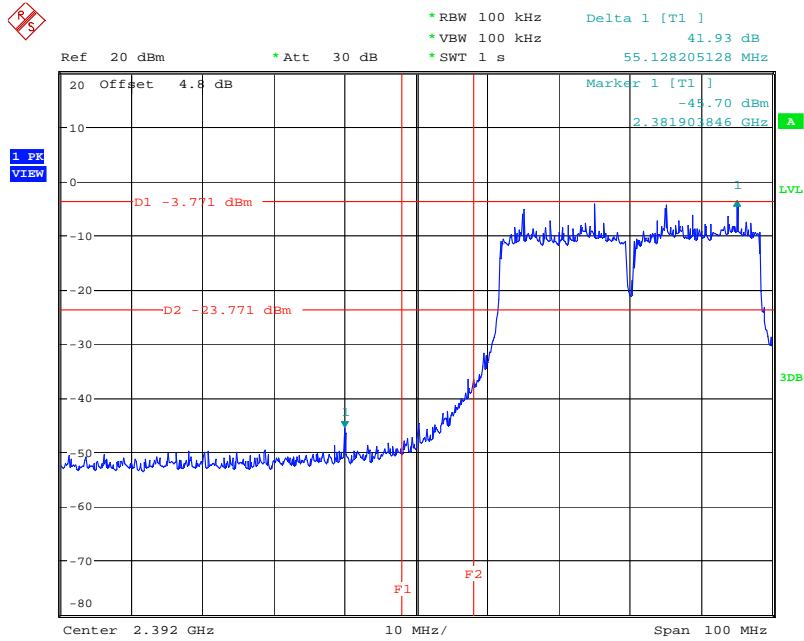
Date: 1.MAR.2010 19:52:54

High Band Edge Plot on Configuration of IEEE 802.11n-2.4G Ant. A + Ant. B (20MHz) / 2462 MHz



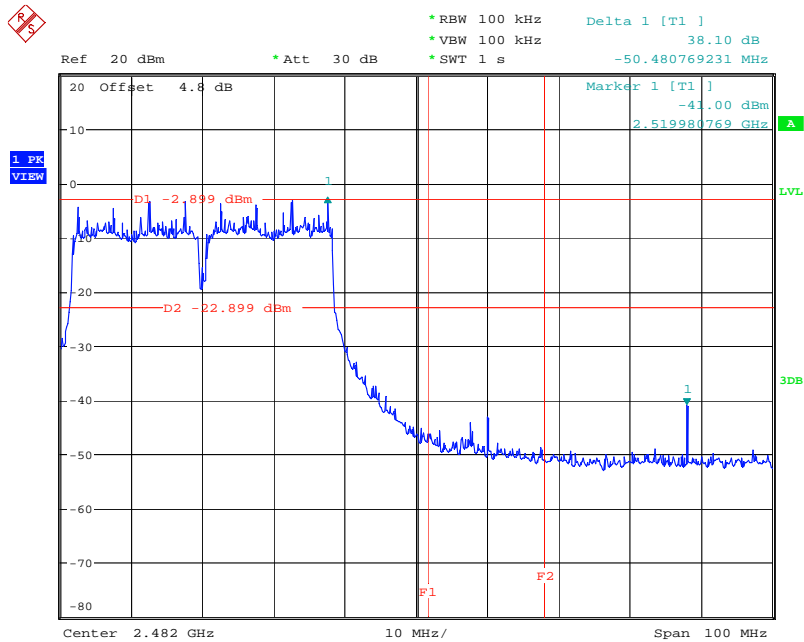
Date: 1.MAR.2010 19:55:32

Low Band Edge Plot on Configuration of IEEE 802.11n-2.4G Ant. A + Ant. B (40MHz) / 2422 MHz



Date: 1.MAR.2010 19:57:57

High Band Edge Plot on Configuration of IEEE 802.11n-2.4G Ant. A + Ant. B (40MHz) / 2452 MHz



Date: 1.MAR.2010 20:01:10



### **3.7 Antenna Requirements**

#### **3.7.1 Limit**

Except for special regulations, the Low-power Radio-frequency Devices must not be equipped with any jacket for installing an antenna with extension cable. An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited.

#### **3.7.2 Antenna Connector Construction**

Please refer to section 2.2 in this test report; antenna connector complied with the requirements.

**4 LIST OF MEASURING EQUIPMENTS**

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMC Receiver	R&S	ESCS 30	100174	9kHz – 2.75GHz	Apr. 15, 2009	Conduction (CO04-HY)
LISN	MessTec	NNB-2/16Z	99079	9kHz – 30MHz	Mar. 23, 2009	Conduction (CO04-HY)
LISN (Support Unit)	EMCO	3810/2NM	9703-1839	9kHz – 30MHz	Mar. 22, 2009	Conduction (CO04-HY)
RF Cable-CON	UTIFLEX	3102-26886-4	CB049	9kHz – 30MHz	Apr. 20, 2009	Conduction (CO04-HY)
EMI Filter	LINDGREN	LRE-2030	2651	< 450 Hz	N/A	Conduction (CO04-HY)

Note: Calibration Interval of instruments listed above is one year.

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Spectrum Analyzer	R&S	FSU26.5	100015	20Hz ~ 26.5GHz	Oct. 29, 2009	Conducted (TH01-HY)
Power Meter	R&S	NRVS	100444	DC ~ 40GHz	Jul. 31, 2009	Conducted (TH01-HY)
Power Sensor	R&S	NRV-Z51	100666	DC ~ 30GHz	Aug. 05, 2009	Conducted (TH01-HY)
Power Sensor	R&S	NRV-Z32	100057	30MHz ~ 6GHz	Jul. 31, 2009	Conducted (TH01-HY)
DC Power Source	G.W.	GPC-6030D	C671845	DC 1V ~ 60V	Mar. 13, 2009	Conducted (TH01-HY)
Temp. and Humidity Chamber	Giant Force	GTH-225-20-S	MAB0103-001	N/A	Aug. 06, 2009	Conducted (TH01-HY)
RF CABLE-1m	Jye Bao	RG142	CB034-1m	20MHz ~ 7GHz	Dec. 02, 2009	Conducted (TH01-HY)
RF CABLE-2m	Jye Bao	RG142	CB035-2m	20MHz ~ 1GHz	Dec. 02, 2009	Conducted (TH01-HY)

Note: Calibration Interval of instruments listed above is one year.

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
AC Power Source	HPC	HPA-500W	HPA-9100024	AC 0 ~ 300V	Jul. 12, 2009*	Conducted (TH01-HY)

Note: Calibration Interval of instruments listed above is two year.

**Radiated Emissions (9kHz~30MHz)**

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz - 30 MHz	Jul. 28, 2008*	Radiation (03CH03-HY)

Note: Calibration Interval of instruments listed above is two year.

**Radiated Emissions (30MHz~1GHz)**

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Open Area Test Site	SPORTON	OATS-10	OS04-LK	30 MHz - 1 GHz 10m, 3m	Jul. 31, 2009	Radiation (OS04-LK)
Amplifier	HP	87405A	3207A01437	10 MHz - 3 GHz	Oct. 30, 2009	Radiation (OS04-LK)
Spectrum Analyzer	Advantest	R3261C	71720606	9 kHz - 2.6GHz	Feb. 04, 2010	Radiation (OS04-LK)
Receiver	R&S	ESCS 30	100168	9 kHz - 2.75 GHz	Oct. 21, 2009	Radiation (OS04-LK)
Bilog Antenna	SCHAFFNER	CBL6112B	2672B	30 MHz - 2 GHz	Jul. 11, 2009	Radiation (OS04-LK)
Turn Table	EMCO	2080	9711-2021	0 - 360 degree	N/A	Radiation (OS04-LK)
Antenna Mast	EMCO	2075	9711-2115	1 m - 4 m	N/A	Radiation (OS04-LK)
RF Cable-R03m	BELDEN	RG8/U	CB012	30 MHz - 1 GHz	Jan. 05, 2010	Radiation (OS04-LK)

Note: Calibration Interval of instruments listed above is one year.

**Radiated Emissions (1GHz~5th harmonic of highest frequency)**

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Spectrum Analyzer	R&S	FSP40	100305/040	9 kHz - 40GHz	Feb. 02, 2010	Radiation (03CH02-HY)
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	30 MHz - 1 GHz 3m	May 11, 2009	Radiation (03CH02-HY)
Amplifier	Agilent	8447D	2944A11146	100 kHz - 1.3 GHz	Jul. 07, 2009	Radiation (03CH02-HY)
Amplifier	Agilent	8449B	3008A02373	1GHz - 26.5 GHz	Jul. 16, 2009	Radiation (03CH02-HY)
Horn Antenna	ETS-LINDGREN	3117	00091920	1GHz~18GHz	Oct. 22, 2009	Radiation (03CH02-HY)
RF Cable-R03m	WOKEN	SMS-MF141-SMS-12M-12	03CH02-HY	30 MHz - 1 GHz	Feb. 25, 2010	Radiation (03CH02-HY)
RF Cable-HIGH	SUHNER	SUCOFLEX106	03CH02-HY	1GHz~40GHz	Feb. 25, 2010	Radiation (03CH02-HY)
Bilog Antenna	SCHAFFNER	CBL61128	2723	30 MHz - 2 GHz	Nov. 30, 2009	Radiation (03CH02-HY)
Turn Table	HD	DS 420	420/649/00	0 - 360 degree	N/A	Radiation (03CH02-HY)
Antenna Mast	HD	MA 240	240/559/00	1 m - 4 m	N/A	Radiation (03CH02-HY)

Note: Calibration Interval of instruments listed above is one year.

**5 TEST LOCATION**

SHIJR	ADD : 6Fl., No. 106, Sec. 1, Shintai 5th Rd., Shijr City, Taipei, Taiwan 221, R.O.C. TEL : 886-2-2696-2468 FAX : 886-2-2696-2255
HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-318-0055
LINKOU	ADD : No. 30-2, Dingfu Tsuen, Linkou Shiang, Taipei, Taiwan 244, R.O.C TEL : 886-2-2601-1640 FAX : 886-2-2601-1695
DUNGHU	ADD : No. 3, Lane 238, Kangle St., Neihu Chiu, Taipei, Taiwan 114, R.O.C. TEL : 886-2-2631-4739 FAX : 886-2-2631-9740
JUNGHE	ADD : 7Fl., No. 758, Jungjeng Rd., Junghe City, Taipei, Taiwan 235, R.O.C. TEL : 886-2-8227-2020 FAX : 886-2-8227-2626
NEIHU	ADD : 4Fl., No. 339, Hsin Hu 2 <sup>nd</sup> Rd., Taipei 114, Taiwan, R.O.C. TEL : 886-2-2794-8886 FAX : 886-2-2794-9777
JHUBEI	ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C. TEL : 886-3-656-9065 FAX : 886-3-656-9085

6 TAF CERTIFICATE OF ACCREDITATION

